

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL. 56, No 12, DECEMBER 1988



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Amateur Radio



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DEADLINE

All copy for inclusion in the February 1989 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, December 30, 1988.

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Editor's Comment

BICENTENNIAL, BYE-BYE

There is less than one month left of Australia's Bicentennial Year. From the viewpoint of the Australian radio amateur, how has it gone, and what did it mean to us? Let me try to recapitulate some of the amateur features of 1988, although some, unavoidably, may be more from the viewpoint of VK3ABP! Well, there I go for a start! The year isn't over yet, but what happened to my Bicentennial AX prefix? Perhaps I've been listening on the wrong bands at the wrong time (and certainly not for long enough!) but few of us seem to have taken advantage of the special prefix. I think only about one percent of those I worked in the Remembrance Day Contest back in August were using AX. Still, it may have stirred up a little more interest on the DX bands. It is (was after December 31) a significant privilege, so let's not knock it.

The year certainly began with a bang! The fireworks involved on New Year's Day and then on Australia Day, January 26, were probably more spectacular than anything seen before in this country. Even if we had not spent January in New Zealand we would probably have seen them only in the way we eventually did, though, via the television screen aided in out case by the magic of video-recording. Much of the spectacle of 1988 has been centred in Sydney. Which I guess is fair enough; that's where it all began in 1788! Of course there was the Royal opening of the new Parliament House in Canberra, the Bicentennial Yacht Race around the continent, the Great Camel Race across half of it. Television enabled millions to see at least some of these events. But generally they had no greater appeal for us radio amateurs than for the population at large, although without the large number of

amateurs who are professionally employed in television the networks might have been seriously embarrassed!

Visits around the country (but obviously only to coastal centres) by tall ships and warships brought some of the pageantry to those of us who do not live in Sydney. And probably the most impressive single event of the Bicentennial has been Expo in Brisbane, a mind-blowing technological tour de force, visited in the six months to October 30 by almost as many people as the population of Australia (16 million). Many were the same faces time after time, of course, but probably more than half Australia "made it" to Expo. This was something which demanded personal attendance; even though some aspects had coverage in many television programs, there was no substitute for "being there". From the amateur viewpoint it is a pity there was so little official co-operation in setting up VIB8XPO on-site, in spite of the best efforts of the VK4 Division. But VIB8ACT was on-air for the Parliament House opening, and use of the VIB8 call signs by clubs and Divisions seems to have been very successful.

So now, it's "Bicentennial, bye-bye". Most of us have enjoyed at least some of it; some may have enjoyed most of it, and many now know more about organising activities than they did before. We will never have another Bicentennial in which to participate, and none of us will be here for the Tricentennial, so I do hope we have all gained or learned something from 1988. Season's Greetings to all!

Bill Rice AX3ABP

Editor

AR

QUITE AN OFFENCE

Local Mooroolbark Police Officer, Senior Constable Keith Lumsden, asked an offending driver: "Do you realise it is an offence not to exchange names and addresses with someone when you have an accident?" The driver replied: "What fence? I not see any fence, I hit a trailer, not a fence."

One way of admitting to an offence!

—Snippet and cartoon courtesy of Police Life (Victoria) October 1988 and contributed by Ken McLachlan VK3AH





SEASONS GREETINGS

Australia's Bicentennial year is now drawing to a close. It started with a televised 'communications extravaganza' and has continued with many varied celebrations and events. One of the results of this activity has been to make many people stop and think about our nation — where we have come from and where we are going.

So too with amateur radio. It has been a year of celebration — the V188 call signs and lots of special events and also a year of changes — novices on two metres, examination devolvement — to name but a few. In a similar vein to the varied opinions about our nationhood, so there are varied opinions about the amateur radio service. Amateurs have taken many opportunities to raise these issues and the 'Future of Amateur Radio Working Party' has been sitting and collating these opinions.

One of the characteristics of amateur radio that I have enjoyed is the variation. It is a hobby where we can easily express our individuality, from the bands and modes we prefer, to our equipment and our level of participation. I hope that this diversity allows us to see the other operators point of view, even though we may not always agree with it!

1988 has seen a number of changes take place in the WIA Federal Office. There has been the appointment of a new general manager and the development of a number of office systems designed to improve the efficiency of the office. These changes aim to make the office more responsive to the needs and views of the amateurs in Australia. In addition, a 'corporate planning' process has been started. This will help identify the key issues to be addressed by the WIA and develop strategies to carry them out. Part of the input to this process was the survey that appeared in October AR.

As I write these notes, the IARU Region 3 Conference in Seoul has just concluded. It was an excellent opportunity for amateurs to meet and examine many issues of mutual

concern. This conference was also important in setting the groundwork for the approaching World Administrative Radio Conference that will be held in 1992 or 1993.

The effects from Seoul will be far reaching as the process of change continues through the amateur ranks.

Everywhere we look these days we see change and the changes seem to be coming faster and faster! However, I don't believe we can hide our heads in the sand, and pretend nothing is happening. Instead, we should take our part in the process and help to build a better society. How? One way is being involved — whether at a club level, a Divisional level or a federal level — and not leaving it to 'someone else'!

Perhaps you can think of other ways. Hopefully one of the things that won't change is our ability to be interested in, and care for, our neighbour.

So, as 1988 draws to a close, spend a moment thinking about what you can do to make this world a better place. Amateur radio, with its ability to communicate across all sorts of boundaries, is uniquely placed to achieve this aim.

On behalf of the Executive and the staff of the Federal Office, I would like to extend Seasons Greetings to you all and may 1989 be a challenging and exciting year for you.

Peter Gamble VK3YRP
Federal President

ar

WIA REPORT OF THE SEVENTH IARU REGION 3 REGIONAL CONFERENCE

The setting for the Seventh Conference of the IARU Region 3 Association was the 22nd Floor Meeting Hall of the Seoul Plaza Hotel, opposite the Seoul City Hall. The Conference ran from Monday, October 10, to Friday, October 14, 1988.

The Conference was attended by the following Societies:

ARRL (representing USA Pacific Island members), CRSA (China), JARL (Japan) KARL (Korea, the host society), MARTS (Malaysia), NZART (New Zealand), ORARI (Indonesia), RAST (Thailand), RSGB (representing British members in the region), SARTS (Singapore) and the WIA (Australia). Three other societies, SIRS (Solomon Islands), PARA (Philippines) and PARS (Pakistan) appointed proxies to represent them.

Also present were the Directors and Secretary of Region 3, the President, Vice-President and Secretary of the IARU and officials from Regions 1 and 2.

The Conference was opened by the Korean Minister of Communications, Dr Oh Myang, who later that day hosted a formal welcoming dinner.

The Conference working-style was a mixture of plenary sessions, working group meetings and social evenings, often followed by further working group sessions. An agenda of 17 items, containing in all 104 papers, was considered. Four working groups were convened, they deliberated and reported on their designated topics which were:

- * Band Planning
- * Packet
- * Preparation for the next WARC
- * Finance

HIGHLIGHTS

Some of the highlights of the Conference included a band plan review which acknowledged the need for increased data communications more band space on some bands to accommodate increased data activity. Regional band plans were produced for the first time for 1.8 MHz and 3.5 MHz, although differing allocations across the Region made it rather difficult to provide plans which completely satisfied everyone.

The future development of the IARU was debated and possible alternative means to assist in financing the international Secretariat examined.

Preparation for the next WARC, including a Region 3 position on frequency bands, the problems facing us prior to and during the WARC, funding and representation at the WARC and possible approaches to clarify third party applications, were all discussed and a number of recommendations adopted.

Delegations exchanged their views and requirements as regards third party communications and agreed on approaches to achieve more liberal and uniform privileges.

The Conference felt Electromagnetic Compatibility was not receiving adequate attention and believed it should be considered before problems develop as precautionary rather than as palliative measures.

Satellite communications posed some problems, satellite funding measures will be examined by the Administrative Council as costs were becoming beyond the resources of individual groups. Interference to satellites and satellite frequency selections were other aspects requiring some attention and co-ordination.

The IARU Monitoring Service received an impetus in its ability to convey reports of intrusions to positively identified stations, and the need to continue this valuable service was emphasised.

Consideration of constitutional matters relating to the Association led to minor changes, however a new set of General Regulations, which the Directors were required to prepare for the Conference, were adopted. These regulations delineate more clearly the operating procedures of the Association, particularly with respect to conferences.

Finally, a budget for the next three years was adopted. It contains a build-up of funds for WARC representations whilst maintaining the Region's operating commitments and expenses. Members will be pleased to hear a small increase in general reserves is planned, within the current IARU subscription rate (which is contained in your Federal subscription component).

MEMBER SOCIETY REPORTS

An important part of the Conference is the reviewing of member societies reports. Some highlights from these reports included:

- * A non-terminating novice licence in New Zealand.
- * Interference problems; on two metres from Singapore, on 10 metres from Hong Kong and more generally from Indonesia.
- * Amateur radio is advancing after restructuring in Thailand. Indeed, the WIA is actively seeking reciprocal licencing rights with Thailand.
- * The WIA reported the allocation of a common band for all amateur licence holders, the USA reported on the success and high popularity of

6K3 IARU

IARU Region III Association Conference
SEOUL, KOREA



their volunteer examiner scheme and Korea reported on the success of a special third party traffic station established for the Olympic Games.

* The Region 3 Directors reports emphasised the need to hold IARU activities in countries throughout the Region to obtain maximum benefit from exposure of national officials to amateur radio.

* Of note to Australia was Director Michael Owen's last report as a Region 3 Office Bearer. Michael was involved in the formation of the Association in Sydney in 1988, and has continuously served since that date. We wish him well in his future involvement in amateur radio as Vice-President of IARU, the first non-North American to be nominated to that high office.

BAND PLANS

There are few surprises in the revised Region 3 band plans, the major changes being the recognition of the need for more data communications spectrum and the revision of narrow band mode segments to achieve that aim.

Band plans were produced for the first time for 1.8 and 3.5 MHz, however the differing allocations across Region 3 do not permit a large degree of co-ordination. For Australia, some care will be required on 1.8 MHz, however the lower limit for SSB on 3.5 MHz remains unchanged at 3.535 MHz, which will please novice operators.

Feeling was evident at the Conference to increase activity on the WARC bands — 10 MHz was seen as a suitable alternative for HF packet message forwarding and there was agreement for limited award credits on 18 and 24 MHz to increase occupancy. It was agreed contests should remain excluded from all three WARC bands.

The Conference heard there were some instances of interference to satellite communications and less than effective co-ordination of satellite frequency selection. Satellite organisations were encouraged to co-ordinate their requirements, both uplinks and downlinks with their Regions. The Region 3 Band Plans will be published in a later edition of *Amateur Radio*.

PACKET RADIO

The Packet Working Group identified activities which warranted further investigation by packet researchers and developers.

They recommended increases to the narrow band modes to accommodate the increase in data communications on 7 and 14 MHz. In particular, the 14 MHz narrow band modes segment has been extended to 14.070 to 14.112 MHz, with a recommendation RTTY and AMTOR continue below 14.095 MHz.

Note was made of the CW beacons on 14.100 MHz, with a ± 500 Hz guard band and "narrow band modes" were re-defined as having an occupied bandwidth of less than 2 kHz.

Attention is to be devoted to societies understanding of third party communications. Indeed, it was discovered that throughout the Region, amateur to amateur communications via amateurs was not considered third party in nearly all countries. The WIA should now seek this interpretation for Australia from DOTC.

It was agreed the growth of Bulletin Board Services should be co-ordinated to provide an efficient service without over proliferation. This has a particular emphasis on HF where societies agreed to attempt to limit the numbers to the minimum necessary.

In keeping packet available to newcomers, it was agreed access to packet networks be achievable using relatively unsophisticated stations.

Because of the interest in this topic, the full working group report will be published in a later edition of AR.

PREPARATION FOR NEXT WARC

It was agreed that the prediction that a WARC with frequency allocation on its agenda will occur in 1992 or 1993, and that amateur bands around 7 MHz and 1 GHz will very likely be involved with possible extensions.

As time is getting short, urgent action is needed.

On the frequency table the need to improve our family of frequencies below 30 MHz was decided.

To that end, we should press for access to a narrow band for experimentation in the vicinity of 190 kHz. And, also shared primary world-wide allocation at 5.005 to 5.060 MHz.

Proposals are also made to improve the allocations at 7, 10, 14, 18 and 24 MHz.

Above 30 MHz, a number of changes were suggested to give all regions access to bands presently allocated in only one or two regions. Also, the proposal was made to establish 430 to 440 MHz as a world-wide exclusive amateur satellite band and that the Amateur Satellite Band, 1260 to 1270 MHz becomes bi-directional (not limited to uplink).

The full proposals will be published in a later issue of *Amateur Radio*.

On regulatory matters, it was seen that 2733 of the International Radio Regulations may inhibit packet radio. It was suggested that the best course of action was for 2733 not to be interpreted by administrations as an inhibition of communications between amateur stations whether directly or through intermediate stations.

If this fails, possible amendments to the radio regulations have been suggested.

All member societies are urged to submit proposals advancing the objectives outlined at the Conference to their administrations, and work towards having a representative of the amateur service on their national delegation, and to this end, must look at means of raising funds.

FINANCE

The Conference adopted a budget for the next three years which contains provisions for all the major forecasted Region 3 activities, plus the progressive build up of the WARC fund, to a level to permit two people to each cover half of the next WARC. At the end of the period, the general reserves are increased by a small amount providing some contingency funds.

All this is being achieved at the current IARU subscription rate (a component of your Federal subscription). However, it does make the assumption membership of each society will remain the same as at January 1988. For the WIA, this means we cannot ease up in seeking new members.

The Region 3 Directors elected for the next three years are:

David Rankin 9V1RH, from Singapore as Chairman.

D D Devan 9M2DD, from Malaysia

Keigo Komaro JA1KAB, from Japan

Fred Johnson ZL2AMJ, from New Zealand, and the only new Director,

David Wardlaw VK3ADW, from Australia.

The next Region 3 Conference will be held in Indonesia during September, 1991, and will be hosted by ORARI.



REVIEW

The Conference was a resounding success with all contentious issues being resolved through consensus and without any confrontation. The host society, KARL, managed everything exceedingly well and did delegations proud. Temporary HL1... call signs were issued to the Conference Delegates and a special event station, 6K3IARU, was freely available for use by all. Regrettably, Conference demands on time limited its use by delegates early in the week.

For KARL, the Conference closed on a high point with their Minister advising reciprocal licence approaches could now be initiated with other countries. We in Australia will follow this lead with a formal request shortly.

Compiled by:
David Wardlaw VK3ADW
Ron Henderson VK1RH
ar

THE UNATTENDED RESIDENCE AND YOUR HOLIDAYS

Ken McLachlan VK3AH

PO Box 39, Mooroolbark, Vic, 3138



The much awaited annual holidays are nearly upon us. It is planned to be a very happy event for you and your family to take a rest from the usual 'grind' of every day life and seek pleasure at the beach, the mountains, interstate or in some cases for the very fortunate readers, a trip abroad.



You have planned every detail meticulously for the ensuing weeks ahead but have you left your home to be the prey of the unscrupulous burglar, who would take delight in removing hard earned and treasured amateur transmitting and receiving equipment, computer hardware with the software and other valuables from the sanctuary of the premises you own, in your absence. You are probably having a chuckle if you have read this far, thinking that this would not and could not happen to me. Nevertheless you are a predictable statistic to be added to the already massive 1988 figures or be at the starting barrier to commence the figures for 1989.

THE BURGLAR

Would you be able to detect what a burglar looks like? Is he or she a highly skilled calculating person? Generally the answer is no to both questions. The 20th century burglar is more than probably unskilled, under the age of 18 years and selects their victims, in their own neighbourhoods by the opportunities you leave for them. Incidentally, many intruders gain entry through an unlocked door or window, or by defeating an interior or poorly installed locking device, generally in daylight hours between mid-morning to mid-afternoon. If your home looks more likely and easier to gain entry too than your neighbours, you are the victim! So firefly make your residence look difficult to enter and occupied.



Do you have all my serial numbers?

LOCK IT UP OR LOSE IT

Sounds ludicrous doesn't it? But it is unfortunately a reality of life. Here are a few suggestions to assist you and your family, keep your valued possessions. You may be insured, but will it recompense you for loss? Probably yes, though it cannot replace sentimental value, anguish, frustration and the loss of your privacy. No insurance company in the world can do that.

Some of the following basic hints, it is hoped will prevent you from the anguish of being burgled at any time during the year and during your holidays, also the hours of defining and remembering what you had? How can I describe it? What make was it? What colour was it? Where was it? And on it goes. These are basics which it is recommended you may adapt to suit your individual situation, when you are absent from your property and/or vehicle.

SERIAL NUMBERS

Note the make, model and serial number of all electronic and electrical equipment in your residence and adjuncts to vehicles registered at that address.

Engrave your driver's licence number (prefixed by the State ie V for Victoria, T for Tasmania, etc) on as many items as possible. If you do not hold a current drivers licence, seek the permission of a close relative to use theirs. An engraved number is unobtrusive when placed near a serial number and as a surety. Place it inside the unit if possible (noting its location on your list). If actual engraving is not practical, special felt pens are obtainable for indelible writing which is practically invisible to the human eye though clearly discernible under Ultra Violet light (These indelible pens are frequently available from local Lions International Clubs and engravers are available from Neighbourhood Watch groups if one is operating in your area). All valuable jewelry, ornaments and such items should be photographed, preferably in colour and beside a ruler to determine size.

Keep the prints and negatives apart and in safe places. Whilst you have the camera out take photographs of the room, so you may identify what was where.

Place your master list in a safe place such as a bank and copies in various safe areas which are easily personally accessible at any time of the day or night, if required. Your precise inventory complete with photographs and locations will



Guard Against This.

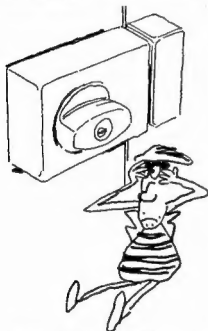


Oh Boy! What a Break.

greatly assist all concerned, if you unfortunately become the victim of a crime of theft or willful damage.

If you have "Security Doors" fitted, keep them locked at all times, making sure that the key is removed. It is quite easy to cut the mesh and remove a key from the inside of a 'locked' door.

Under no circumstances allow any representative of any authority onto your premises without first seeing their credentials. All Telecom/Electricity Authority and such like personnel have accredited identification and will readily present it for perusal. No identification, no entry — accompanied with a quick call to the Police with a description. You may save someone else from the predator.



This is a double cylinder automatic deadlatch (screwed to the inside of the door) and is a cost effective fortification.

WHEN THE RESIDENCE IS NOT ATTENDED

1. Lock all doors/windows/entrances.
2. Keep all ladders and tools in a locked area. If you cannot secure your ladder, use a chain with a hefty lock to an immovable object such as a fence.
3. Don't leave messages on your door as they are an open invitation to the opportunist.
4. Keep garage doors closed, an open door with no vehicle is a 'dead' giveaway, that the residence is unoccupied.
5. Don't have packages delivered whilst being absent from the premises and being personally unable to remove them to a safe place.
6. Don't let the mail box give you away. Make sure it is always cleared of 'junk' mail and large enough to store one days filling. Near Christmas, this means a big 'box'.
7. Don't leave a key in a special spot (under the flower pot at the back door), so that Aunt Agatha can use it if she visits. If you are so keen on Auntie's welfare then give her a key, she is more trustworthy than an intruder.

8. Always separate your keys when you leave your car at a parking lot or for service. Remember to also disable a transceiver to comply with the terms of your amateur licence.

9. Don't give keys to workmen, no matter how long you have known them or had them working for you.

10. Placing advertisements of social events, obituaries, etc, give the predator a marvellous opportunity to gain entry and remain in your property for a considerable uninterrupted period. Also beware of whom you discuss your intentions of being absent from the premises with and in whose hearing. You may be unwittingly writing an open invitation to an 'eavesdropper'.

YOUR HOLIDAY

The time has come to commence the journey, the car is packed and your family is getting anxious to be underway but please consult the following check-list which is only printed as a guide of the major items that should be attended to.

- Place any valuables not required, in a bank or other safe place.
- Make sure your garage and all outbuildings are securely locked.
- Is someone able to get under the house? If so, secure all entry points.
- Is someone able to gain entry through the roof? Sounds ludicrous, nevertheless a considerable number of unlawful access to premises occurs, due to this oversight.
- Have you cancelled, milk, papers, mail, ice and other regular deliveries?
- All electric appliances should be switched off and plugs removed from all wall sockets, except any automatic timers connected (programmed in a random mode) to lighting and/or radios in the home.
- Have you turned gas appliances and the lead taps to the Hot Water System and washing machine off? Heaters and hoses have the nasty habit of developing faults causing flooding at the most inopportune moment and this holiday may be just that occasion.
- Checked that all doors and windows are securely closed?
- Have you informed a trusty neighbour of your absence and acquainted them of your itinerary should the need arise to contact you.



Remember, Prevention is better than Cure!

- Ask your trusty neighbours to be 'nosey' all the time during your absence. If they have a second car, suggest that they may use your driveway during your absence. (Don't arrive home at 3 am in the morning and expect them to shift it though).
- Hide your garbage bins.
- Hang out some washing such as old towels etc to give the residence a lived in look. Your friendly neighbour may be persuaded to change the layout occasionally during your absence.
- Have you made adequate arrangements for your pets?
- If you are going to be absent, with no one residing in the residence, have you read your insurance policy? Many policies have a 28 day non-occupation clause.
- Have you considered having your telephone disconnected temporarily? Telecom will temporarily disconnect and reconnect on your return. You may save in rental which would cover the fees involved for this service. Remember you are responsible for the charges on all calls made from your phone. Telecom will give you an alternative number if someone is going to caretaker for you. They are then responsible for all the calls they make in your absence.



These are only a few of many pertinent points written in a booklet entitled *Secure Living* A Victoria Police Guide. The preface to the publication is written by Chief Commissioner of Police Kelvin Glare. Mr Glare in the opening paragraph states "Crime prevention is not just a police responsibility — It is everyone's responsibility".

Police Officers are human beings as you and I are. They have the dutiful task of upholding and enforcing legislation. Most readers will, I am sure, agree that this is an unenviable, dangerous and at times unfortunately a thankless task, nevertheless if you approach your local Police Station seeking specific advice on security, considering the workload at the time, residents will be given expert assistance and suggestions.

In Victoria over the last few years a Neighbourhood Watch program has been instituted and found to be quite successful in dramatically deterring unwanted visitors. It is basically a self-help, locally formed facility of reporting unusual occurrences to the authorities, as and at the time they are seen.



Police Number ? ? ? ?

Incidentally do you know the telephone number for the police in your city or town without having to look it up? Please memorise it and for place it in a prominent location near all telephones on your premises — one day you may need it!

The booklet *Secure Living* mentioned above, is recommended reading and well worth the price of \$3.20 postage paid, being obtainable from the Publishers, Marsec Marketing Security, 405 Clarendon Street, South Melbourne, Vic. 3205. If you apply for it, please send your remittance by cheque or Money Order and mention that you saw it in *Amateur Radio*.



Don't Leave Messages on Your Door.



Do Advertise your House Number.

HOLIDAY MOTORING

It would remiss of me not to mention to holiday motorists the necessity of road safety. Speed restraints, seat belts, safety harnesses and such regulations, legislated for your safety, differ from State to State and every licensed driver is obliged to make them self aware of all the regulations of their home State as well as those that they may visit.

One little known act concerns Communication Equipment and it is printed directly from the Victorian Road Safety (Traffic) Regulations 1988*, for your benefit.

Make this a happy and safe Christmas, so that next Christmas will be a happy one too! Seasons Greetings from this QTH to your QTH.

REFERENCES

1. *Secure Living* — A Victoria Police Guide (C) 1987 Victoria Police.

2. *Victoria Road Safety (Traffic) Regulations 1988*.

I am indebted to the Chief Commissioner's immediate staff, Inspector Noel De Sair, Inspector Chris Coster and other senior officers for their time, advice, patience and assistance in preparing this article and the permission to quote and use material from *Secure Living*.

Communications Equipment

1505. (1) Except with the approval of the Road Traffic Authority and as provided by sub-regulation (2), the driver of a vehicle must not, while driving a vehicle, use a hand held—

- (a) telephone; or
- (b) microphone; or
- (c) similar instrument or apparatus—

in the vehicle.

Penalty: 2 penalty units.

(2) Sub-regulation (1) does not apply to the driver of a vehicle that can be used as an emergency vehicle.

(3) Except with the approval of the Road Traffic Authority—

- (a) a television screen; or
- (b) any other means of visually receiving a television broadcast, telecast or other signal—

must not be installed or used in a motor vehicle if all or part of its viewer or screen—

- (c) is visible directly or indirectly to the driver whilst in the driving seat of the vehicle; or
- (d) is likely to distract the driver of any other vehicle.

Penalty: 2 penalty units.

(4) Sub-regulation (3) does not apply to or in respect of a device designed to aid the driver of a vehicle to manoeuvre the vehicle.

Seat Belts to be Worn

1506. (1) A person must not be seated in a motor vehicle that is in motion in a seat for which a seat belt is provided unless—

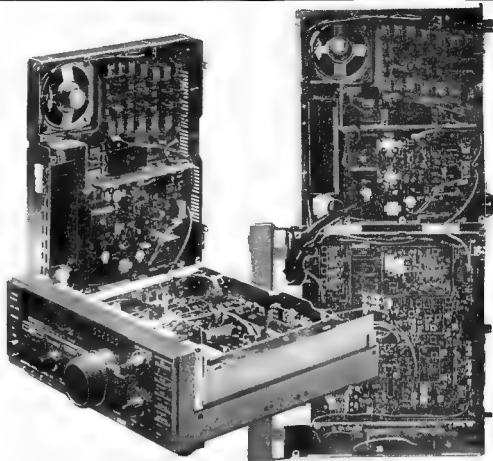
- (a) the person is wearing a seat belt; and
- (b) the seat belt is properly adjusted and securely fastened.

Penalty: 5 penalty units

(2) Sub-regulation (1) does not apply to—

- (a) a person whom the Road Traffic Authority has certified is a person to whom it is impracticable, undesirable or inexpedient that sub-regulation (1) should apply; or
- (b) a person engaged in driving a motor vehicle in reverse; or ...

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Try This!

A SIMPLE ALARM

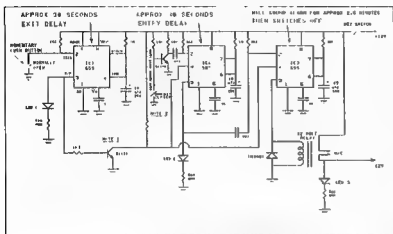


Figure 1.

NOTES

1. This transistor disables the reset line so that the alarm does not falsely trigger when power is switched on. It also acts as an inverter.
2. Twist the sensor leads to minimise RF pick-up. In severe cases, also thread through ferrite beads.

Here is a circuit for a simple alarm incorporating exit and entry delays along with a fixed alarm operation period. Whilst making no claims for originality, it has been found to be reliable over a period of some months.

Power to the circuit is controlled by a key operated switch. The circuit consists of three parts. The first part is the exit delay comprising IC1 and its associated circuitry. The normally open push button is operated to start the exit delay timer. LED1 lights to indicate this and the operation of the alarm is inhibited for the selected time delay. Once the time has expired, the alarm is armed.

If the normally closed contacts of the door sensor are opened, the entry delay timer (IC2) is activated. LED2 lights to indicate this condition. If the alarm has not been turned off, or otherwise disabled, by the time this timer has expired, IC3 is triggered, activating the alarm relay. The alarm will operate for the period set by the timing components of IC3. After this period, it will reset.

Coaxial Cable Specials

Low Loss VHF/UHF Cables

Coaxial Cables

Description	Trade & U.L. Type Number	AWG (Stranding) Dia. in./mm Nom. D.C.H.	Insulation & Jacket Dia. in./mm Nom. D.C.H.	No. of Shields & Material	Nom. Imp. Ω	Nom. Vol. of Shield	Nominal Capacitance pF/ft. m	Nominal Attenuation dB/100 ft. m
RG-213-U MIL-C-17D	9913 60C	13 (7x21) 089 bare copper 1.870/1mm 6.113/1mm	Poly-ethylene 285 7.24	1.20/1mm 3.91/1mm 97% shield coverage	50	66%	30.8 101.0	5.2 10.5

Description	Trade & U.L. Type Number	AWG (Stranding) Dia. in./mm Nom. D.C.H.	Insulation & Jacket Dia. in./mm Nom. D.C.H.	No. of Shields & Material	Nom. Imp. Ω	Nom. Vol. of Shield	Nominal Capacitance pF/ft. m	Nominal Attenuation dB/100 ft. m
RG-213-U MIL-C-17D	8267 60C	13 (7x21) 089 bare copper 1.870/1mm 6.113/1mm	Poly-ethylene 285 7.24	1.20/1mm 3.91/1mm 97% shield coverage	50	66%	30.8 101.0	5.2 10.5

RG-213-U MIL-C-17D is a low loss, high performance cable designed to fill the gap between RG8 to RG213 coaxial cables and half-inch semi-rigid coaxial cable. Although it has the same outside diameter as RG8, it has a substantially lower loss, therefore providing a low cost alternative to hard line coaxial cable. Price per metre from Acme Electronics is only \$5.10.

BELDEN Broadcast Cable 8267 — RG213 to MIL-C-17D is only \$5.24 per metre while BELDEN Commercial Version RG213 — YR22385 is \$2.25 per metre. Prices do not include Sales Tax.

Also available from Dick Smith Electronics



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THE “22” SPECIAL

Ken Kimberley VK2PY
21 Nicoll Street, Roselands, NSW 2196

This article features a two transistor two megahertz frequency meter specially designed to use a moving coil meter as the readout — hence the “The 22 Special” appellation!



This handy little device owes its birth to an idea developed for use in a new square wave generator which will be presented in the near future. This instrument will be continuously variable over a range from about 10 Hz up to 2 MHz, hence some form of dial was required. Suitable mechanical ones are about as common as "mens' teeth" today, and are also difficult to calibrate neatly.

It seemed feasible that some electronic method could well be employed here. Yes, dedicated chips and digitised (LED and LCD, etc) readouts are available at a cost. However, to keep the project simple, it was decided that the added complexity and expense was not warranted. A simple method was found in the analogue world.

The idea, which will be explained shortly, worked very well. The correct selection of components, and a little care, enabled the matching of the meter markings with that of the oscillator frequency, ie a 0 to 100 scale represents a range of 0 to 100 Hz, 0 to 1 kHz, etc. Likewise a 0 to 30 scale could be calibrated for ranges of 0 to 300 Hz, etc.

Note the term used in this article is "Frequency Meter" and not the more common "Counter". This is because this instrument is purely analogue, and there are none of today's digital techniques used.

The accuracy and definition of this instrument cannot match that of the usual "Digital Frequency Counter." However, at around \pm three percent FSD it is more than adequate for general-type audio measurements.

Having pointed out a major disadvantage, let us look at the advantages. This device has some decided advantages over its big brothers — some of which are:

- a) Being analogue, it does not require a time base and therefore a warm-up period is not really necessary
- b) Unlike the counter type, this meter will follow a changing frequency, so it does not have to wait for the next complete time base gate period
- c) It does not produce a myriad of spurious signals which may interfere with your measurements
- d) Simple construction, no PCB required, and it is very inexpensive. If the author can build it, so can you!

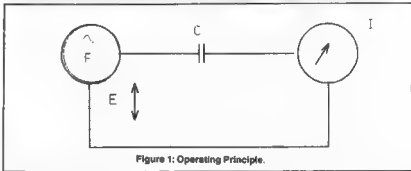


Figure 1: Operating Principle

HOW DOES IT WORK?

Readers are referred to articles published in *Amateur Radio*, October 1987 and June 1988. These were written by this author and dealt with direct reading capacitance meters.

The "22" Special works in a similar manner, hence the following will be kept brief.

Now, for the purpose of this explanation, Assume the applied voltage (E) (see Figure 1) remains constant, then it can be shown that:

a) At a fixed frequency (F) the current (I) is directly proportional to the capacitance (C) after the manner of the "C" meters mentioned previously.

b) For a given C, the I will be directly proportional to E

UNCLASS

Refer to Table 1. Here, E has been set at 15916 volts. A very old choice one would think. However, by doing so makes the i come out in round figures, thus making for clearer understanding of the results. A value of 0.1 μF was selected for C.

Column 1 lists F in 100 Hz increments (remember the 0 to 100 or 0 to 1 meter). Number 2, the calculated X_c in ohms and 3, the I in microamps.

Now, look to Columns one and three — the numbers are identical. This proves statement B, thus forming a firm basis to the design of a direct reading frequency meter. Of course, there are other effects, which to some degree control the total circuit impedance. For practical purposes, these have been ignored in this explanation. However, these parameters will be mentioned again further into this article.

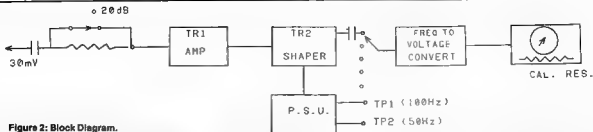
Having established the feasibility of such a design, attention was then directed towards developing a practical circuit. This was accomplished within simplicity concepts.

It was a little difficult to find enough blocks, (See Figure 2) however one was drawn as an aid to the reader's comprehension of this project.

The signal to be measured is coupled, via the input network, to the amplifier TR1 and thence is fed to the waveform shaper TR2. From here, the square wave, so formed, goes to the 'Frequency to Voltage' converter. The frequency related

C = 0.1 uF		E = 1.5916 V
FREQUENCY Hz	Xc ohms	CALCULATED I microamps
1000	1591.6	1000
900	1768	900
800	1989	800
700	2274	698.9
600	2653	599.9
500	3183	500
400	3879	400
300	5305	300
200	7958	200
100	15916	100

Table 1: Frequency Versus Current.



voltage (E) is then indicated by the meter which is shown in the next block. This also contains the calibrating and meter protection circuits. Lastly, there is the power supply — this is quite standard and does not require regulation

TP1 and TP2 provide a reference source of 100 and 50Hz respectively. Both frequencies are derived from the power supply.

CIRCUIT DESCRIPTION

The circuit is quite basic and contains only two bipolar transistors. It is difficult to imagine a design so simple in concept and execution.

INPUT CIRCUITRY

Although the "22" can handle signal levels up to at least 25 volts (74 peak-to-peak) with comparative ease, it was decided to add a 10:1 (20 dB) attenuator. This pad is used on those rare occasions when it is necessary to measure higher level signals.

The input impedance (Z) of the amplifier itself was measured and is about 500 ohms. With the addition of R1 (5.6 k) this becomes 6 kohms direct and 62 kohms looking into the attenuator.

Note, overload protection diodes have not been used in this design, the reason being the bipolar transistors themselves act as diodes for large signals; is the base emitter junction as an efficient diode in the forward direction and usually zener at around eight volts in the reverse. It is only necessary to limit overload current and this is the task of R1 assisted by the 470 ohm emitter resistor.

AMPLIFIER — SHAPER

TR1 and TR2 are both type 2N2222A. However, almost any small signal high gain transistor would do. TR1 has been somewhat over-biased to assist in the wave shaping process.

The amplifier, and slightly clipped, signal now goes to TR2 via a current limiter. The use of relatively low resistances in both the base and collector circuits, 680 and 180 ohms respectively, ensures that this stage is grossly overdriven. The amplitude of the resulting output square wave is almost constant regardless of the input level and frequency for signals above about 0.05 volts (50 mV).

FREQUENCY TO VOLTAGE CONVERTER

The highly processed signal now passes to the F/V converter via the range selector switch S3. Six basic ranges are provided. Five in decade steps from 0 to 100 Hz through to one megahertz and the last 0 to 2 MHz. A divide by two facility on the meter affords better accuracy at the lower end of each scale, and, additionally provides a full scale calibration point, ie 50 Hz by courtesy of the mains transformer.

Earlier in this article mention was made of other parameters which might cause unwanted aberrations. (Some bother was encountered in early development work). These other parameters are inductance "L" and resistance "R"

At the frequencies being used, the inductive reactance is low enough to be neglected, but "R"

is a different story. The total circuit "R" must be considered and consists of

1. Source Impedance.
2. Metering Resistances.
3. Capacitor Dielectric and Wiring Losses.

The value of (3) is small in comparison to the 400 ohms total of (1) and (2), hence it will be omitted from this explanation.

We all know that $Z = \sqrt{X^2 + R^2}$

Substituting values (refer Table 1)

(a) FSD $Z = \sqrt{1592^2 + 400^2}$
 $= 1641$

$$\begin{aligned} 50\% \text{ FSD} &= \sqrt{3183^2 + 400^2} \\ &= 3208 \end{aligned}$$

In the above worked examples it will be noticed that the "R" effect of 400 ohms has increased the circuit "Z" by 49 ohms for (a) and 25 ohms for (b). This represents a difference or error as a percentage of three percent and 0.8 percent respectively.

Now, if "R" is made 1000 ohms, then the errors become 18 percent and 40 percent, thus making the circuit useless. Conversely, if "R" is only 100 ohms, the new figures are 0.2 percent and 0.05 percent.

Therefore, it certainly is obvious that "R" must be kept to a minimum and that 400 ohms appears to be about the upper limit.

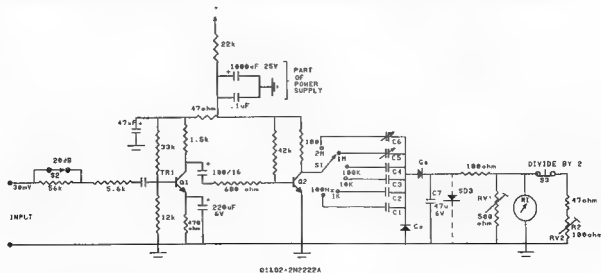


Figure 3: Circuit Diagram.

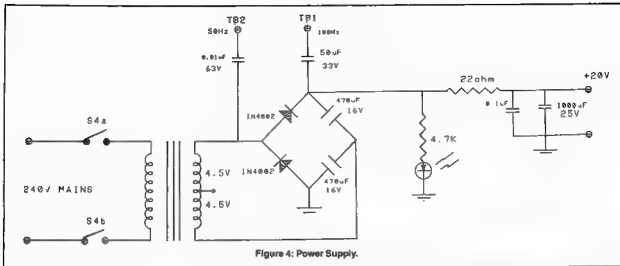


Figure 4: Power Supply.

METERING

The amplified signal is presented to one of the range setting capacitors, C1 through to C6. The resulting current is then rectified by two Germanium diodes (not Silicon) connected in doubler configuration, which in turn, charges C7.

This voltage is proportional to the frequency and is displayed by the meter M1, the FSD (Full Scale Deflection) which is adjusted by RV1 and RV2. A one kilohertz input signal and C2 (0.1 µF) selected produces some 420 mV at C7 when the calibrating potentiometers are set correctly.

METER PROTECTION

The main overload protection is via diode SD3. It is well-known that silicon devices have a turn on voltage of around 0.6 volts. It is this parameter which forms the basis of this function.

The explanation goes like this.

As the applied frequency is increased towards full scale, so does the voltage across C7. However, little current is passed by SD3 until about 450 mV is approached. From here on up it increases dramatically and at 600 mV is such that a clamp condition is established. Thus the maximum overload will be around 50 percent and will not damage the movement.

Secondary protection is afforded by damping. This takes two forms, one is the meter itself. Most 100 microamp, 1000 ohm meters use an aluminium coil former, thus forming a closely coupled short circuit turn. This provides an effective damping medium as defined in Lenz's Law.

An additional method is to add large value electrolytics across the movement. This is an adjust-on-test exercise and is to personal preference.

POWER SUPPLY

This is a straight forward affair, nothing particularly unusual except the use of a voltage doubler instead of the ubiquitous bridge. Why? Well, for two reasons — firstly the author had the 4.5-0-4.5 volt transformer (DSE 2840) in the junk box and secondly, the cost factor.

One point of interest is the use of rather low value capacitors in the storage circuitry. This was done to enhance the 100 Hz content so that a fixed full-scale calibration point could be estab-

lished, and is available from TP1. The resulting ripple (= 500 mV 100 Hz) was kept out of the supply line by a simple "RC" filter network (22 ohm/100 µF) inserted in series with the positive bus and doubler.

A "motor-boating" problem, which only appeared in the final version, was cured by the insertion of a decoupling circuit in the supply feed to TR1.

A low power 50 Hz signal was derived from the transformer secondary and is available at TP2.

METALWORK

The final layout will be mainly dictated by the reader's choice of components, in particular the meter and cabinet size. However, a suggested front panel layout is given in Figure 5.

A larger meter will make for easier reading and better accuracy. A 100 by 80 millimetre model would be about optimum, but it still takes up quite a lot of front panel space as compared to the internal components. Perhaps the 58 by 52 millimetre size may be preferred, thus making use of a smaller cabinet possible and a saving of about \$5.

The use of a metal cabinet to house this unit is almost mandatory. The two stage input amplifier has a rather high gain, hence precautions must be taken to eliminate extraneous pick-up. At this QTH, a finger brought near the input terminals produced a significant response from the local broadcast stations.

To commence, refer to the diagram and photograph. Observe that the mains wiring and direct current metering have been kept well removed from the front end arrangement.

Firstly, collect all major parts together and move them around on a sheet of paper until a satisfactory layout is found. When you are happy with this layout ensure that the front panel components do not interfere with those to be mounted internally.

Next drill and cut out necessary holes. Proceed carefully as a hole drilled in the wrong place is an embarrassment! Debur the edges and temporarily mount all components. Any omissions will become apparent and should be corrected at this time.

When all is correct, dismantle and prepare the case and front panel for spraying. It is strongly recommended that the spray paint manufacturer's instructions be strictly adhered to other-

wise you may not be satisfied with the results. It is also a good idea to paint a small scrap of metal at the same time.

Neatly letter the front panel. Try to keep all legends parallel with the top edge. It is worth the extra effort as a neat finish is something of which to be proud. The scrap piece of metal is the control sample as sometimes a clear lacquer finish may not be compatible with the colour coat. The idea here is to try the lacquer on the scrap and only proceed when satisfied with the results.

WIRING

A "Blob-type" board was used and proved quite handy. It measured 180 by 110 millimetres and was large enough to carry all of the components, including those of the power supply, metering resistors, etc., as well as the FV converter calibrating.

Blob Board is probably not now commercially available, however a Dick Smith Electronics Type H5610 could be used. There will not be sufficient space for the power supply and a second board could be used, or alternatively, it could be built directly onto the metal work with the assistance of a couple of tag strips, etc.

A number of circuit pins (Cat No H5590) will be required if employing the H5610 board. It is recommended that these be used at the following points: signal and power supply inputs, transistor connections, metering outputs and the calibrating capacitors, etc.

The actual wiring is simple and minimal. Of course, the main circuit board will have been mounted so that the C1...C6 pins are immediately adjacent to the range selector switch. This arrangement will enable these connections to be kept short and rigid.

WARNING

This instrument derives its power from the mains, hence certain safety precautions should be observed.

In the author's model, all of the associated mains wiring was kept off the electronics board. Also, no terminal block was provided for the three core flex, instead, the active and neutral wires connect direct to the back of the DPST toggle switch (S4). The earth wire connects to the metal work via a solderless tag, screw, washer, lock washer, and nut.

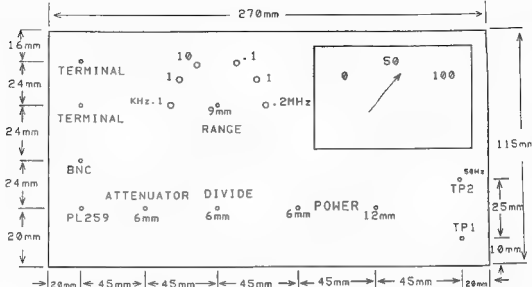


Figure 5: Suggested Front Panel Layout.

The elimination of the mains terminating block reduces the number of exposed danger points, however, the mains switch should be covered — say, several layers of insulation tape — as a protection to "poking fingers."

The main thing is to observe the usual good workshop practices. This includes the use of a rubber grommet where the main flex comes through the case. Also, lockwashers should be provided under every nut.

CALIBRATION AND TESTING

To this point, little mention has been made of the series capacitors in the Frequency to Voltage converter. These are reasonably critical and a little care should be exercised in their selection.

An elegant solution to this problem is as

follows:

Go through a supply of capacitors, in the junk box or otherwise, and carefully measure each one. The professional approach is to aim for "C" values in the progression 1.0, 0.1, 0.01, 0.001, etc. This is not strictly necessary as long as the significant figures are identical, is 0.9 0.09, etc or even 1.0 0.11 etc. Aim for the closest possible tolerance, even if you have to pad up lower value units. Remember, care taken here will reflect in the final accuracy achieved.

If you haven't built one of the capacitance meters previously described by the author in AR, or you don't possess one, it is possible to use empirical methods. More about this later.

At this point, assume that a selection has been made and fitted. Proceed as follows:

MUSIC REVIEW

1. Connect a multimeter across the DC supply bus.
2. Plug your unit into the 240 volt mains and switch on.
3. If all is correct the multimeter should read about 20 volts.
4. Move the meter to T1 and measure the alternating 100 Hz voltage. It should be around 50 mV. Note, this is the 100 Hz reference signal mentioned previously.
5. Check the 50 Hz reference by moving the multimeter to TP2.

FUNCTIONAL TEST

6. Switch off and check that the meter mechanical zero is adjusted correctly.
7. Set RV1 and RV2 to approximately half rotation
8. Re-power and observe the meter which should read close to zero.
9. A significant indication could be due to noise, stray pick-up or self-oscillation. Appropriate steps should be taken to eradicate this.
10. Touch input terminal and the meter should give a sizable deflection.

CALIBRATION

11. Set the range switch to 100 Hz and enable divide by 2 (S3)
12. Connect the input to TP2 via a shielded cable.
13. Adjust RV1 for FSD
14. Change to TP1, disengage divide by 2, and adjust RV2 for full scale.
15. Re-check steps 11 to 14. This completes the calibration up to 100 kHz. The two higher ranges require the use of an external source
16. Set this source to 1 MHz using the station receiver to ensure accuracy.
17. Connect the 1 MHz to your frequency meter and adjust TC1 for correct reading.
18. Calibrate 2 MHz using TC2.
19. As a final check, go through steps 11 to 18 again.



Main Electronics Board

RESIGNATION OF VK CORRESPONDENT TO 73 MAGAZINE

Back in 1982, the WIA was approached by the American magazine 73 *Amateur Radio* to provide an Australian correspondent for the International section of the magazine. For those who have not been able to see at least the odd copy of 73 since then, it has featured each month a collection of news items about amateur radio from various countries around the world, a column of two from each country, headed by its national flag.

Jim Joyce VK3YJ, was asked if he would like to take on this quite demanding task, and agreed to do so with some hesitation, as he had no previous journalistic experience. Nevertheless Jim has done a magnificent job ever since, and was the only foreign recipient of one of the awards given to its contributors by 73 for meritorious service.

Unfortunately, all good things come to an end and after 45 articles and 60 000 words, Jim can no longer find time to continue as the VK columnist. On behalf of all Australian amateurs, the WIA thanks him sincerely for keeping our activities in front of the American amateurs for so long. Is there anyone out there who would like to volunteer to take over the job?

or

MAIL GETS THROUGH

Many complain about our mail delivery service, including yours truly, but this little excerpt from *Weather News*, must give anyone confidence in the system.

The letter and contents addressed in pencil are reproduced hereunder as they were written, and arrived on the desk of Mr Bill Ware who is Antarctic Liaison Officer for the Commonwealth Bureau of Meteorology.

Any Scientist
Any Weather Station
South Pole Antarctica

Dear Sir/est

Please send me some pictures of Antarctica. We are learning about it. Are teachers read us a story about it. Why did you go down there?

The young lady, a Miss Karmin Diedrick of Amherst, Ohio, USA was sent a package of Antarctic leaflets, general information and a note from Bill.

One has to congratulate all parties concerned in getting the letter to its destination and Bill, for his prompt reply.

From *Weather News*, September 1988, issue No 287

or

THREE-YEAR MEMBERSHIP OF THE WIA

If you are a Full Associate, Pensioner, or Family member of the Institute, and your membership renewal is due on or after January 1, 1989, you will be able to avail yourself of a new facility for members.

A three-year membership.

If you want to renew your membership for three years, instead of just one year, simply multiply the amount appearing on your membership renewal notice by three and forward your payment to the Federal Office in the usual manner.

Obviously, with inflation and fees rising each year, this facility will save you money.

or

PC IN YOUR POCKET

Alan of the United States is launching an IBM compatible personal computer the size of a Walkman, in November.

Its liquid crystal screen displays eight lines of 40 characters. With 512k of internal RAM and 256k of ROM, it can do spreadsheets, an address book, calculator, diary and wordprocessing.

or

Internal View.

That completes the calibration procedure given suitable reference capacitors. As mentioned before, those without access to a capacitance meter have not been forgotten. The results obtainable are quite satisfactory, however, a little additional work will be required.

A known signal source is necessary. A divided down crystal controlled marker is ideal. However, failing this, an accurate signal generator will do.

ALTERNATIVE CALIBRATION METHOD

Purchase a 0.1 uF 63 volt one percent polystyrene (Dick Smith Cat No R2780) and install it in the position designated C2. This is the 1 kHz range and becomes a reference point. Proceed as follows.

1. Power-up the "22" Special and the signal source.
 2. Allow both to stabilise for about five minutes.
 3. Set the source to 500 Hz and connect to your unit via a shielded cable.
 4. Enable divide by 2.
 5. Adjust RV1 for meter full scale deflection (FSD).
 6. Change the input to 1 kHz, disengage divide by 2 and use RV2 to obtain FSD.
- NOTE: the basic sensitivity has now been established, hence the two trimming potentiometers should not require further adjustment.

7. Calibrate the two highest ranges by following steps 16 to 18 of procedure "Calibration" above.

The point has now been reached where work is required! The idea here is to transfer the accuracy of the 1 kHz calibration as follows. Fit the following value capacitors 0.02 uF, 0.002 uF and 820 pF to switch positions 100 Hz, 10 kHz and 100 kHz respectively.

8. Set the source (maybe check with a receiver) and range to 100 kHz. Your meter will indicate a value less than 100.
9. Trim C4 by adding small capacitances until FSD is obtained. Try to keep the number of additions down to a minimum.

THE WEST AUSTRALIA TO SOUTH AUSTRALIA TWO METRE PATH

A real "bight" of the action!

John Hawkins VK6HQ
39 Glyde Road, Lesmurdia, WA 6076

Sandgroppers get a goodly go at VHF/UHF tropospheric ducting, not only up and down the west coast, but also, and more spectacularly, across the Bight from the southern ports, particularly Albany. A real "bight" of the action, as it were!

For the uninitiated, tropo-ducting occurs when a layer of warm dry air becomes trapped beneath cooler moist air, refracting the signal along a track parallel with the Earth's surface, with a flat path being good and a path over water even better. One can take a reasonable punt on when "local" ducting will make DX communication available but to predict the onset of an opening between Perth and Adelaide is nigh on impossible. Such openings are infrequent. Like several years infrequent!

Openings between Albany and Adelaide happen more often, although if you don't happen to live in Albany, the odds against getting yourself and your equipment there right at the appropriate instant are long. Nevertheless, for once, luck came my way.

In 1980, no one was sure whether the Perth/Adelaide two metre run had been accomplished. A handful of Perth VHF enthusiasts could certainly recall when last the Adelaide beacon was heard. But I was, to say the least, sceptical of it ever happening when I was around

However, when on the morning of January 23, 1980, as on countless previous occasions, I turned my five by five skeleton slot through an easterly quadrant, stopping only to squeeze the PTT, to my unbridled joy back came an identification with a figure five in it. Adelaide at last!

It could have been Sporadic E, but the weather map pointed to a classic ducting situation; a high in the Great Australian Bight and trough down the west coast. Anyway, I felt in my insulators it was a ducted signal, a bit like the way the discerning Hi Fi buff claims to pick a valve amplifier from a transistor amplifier by the feel of the sound. Suffice to say, the signal that morning conjured up memories of the epic film *Zulu* and the sound of spear on shield wafting over miles and mile of veldt.

I drew a breath, microphone-hand trembling just a little. "This is VK6HQ in Perth calling CQ and listening". Even the word "Perth" seemed strange and unreal. Nothing, but the repeater tail. Emphasising the "6", I tried again "VK6HQ on frequency and listening for any calls". Silence. I supposed they were all at work. After breakfast, I dialled up 144.100 and tried sideband. Still no replies, but someone came up momentarily and anxiously asked me to keep the calling frequency clear. "There's some DX coming through!" he said. I was not making it on

sideband because of the vertical antenna, I thought and sadly turned off the set and left, late for work, knowing that several Perth stations were on frequency and were doubtless going to get through?

Since then there have been isolated VHF/UHF openings from Perth to Adelaide, notably the one when Bob VK6KRC made it on 70 centimetres, but the thrill of that day in 1980 stays ever in my memory.

It is funny how things go full circle. I was in Adelaide for a conference during the first few days of December 1987 and, as one is wont to do, used limited spells of off-duty time to work the local repeaters. I remarked to Les VK5ALW, how eerie it was to reflect that, years before, I had accessed the repeater we were now using, but from Perth, and nobody heard me.

"Yes! Funny you should mention that," Les said. "I heard you." I couldn't believe my ears. "I couldn't get back to you," he said. "But I did go on to work several Perth stations."

It was some weeks later that my curiosity (and, I confess, my ego) finally got the better of me and I wrote to Les asking if he would mind letting me have a copy of the entry in his log. He did more than that and, as can be seen, it was a busy and extraordinary day for VK5ALW that day in 1980, and confirmed my "trip" across on two metres.



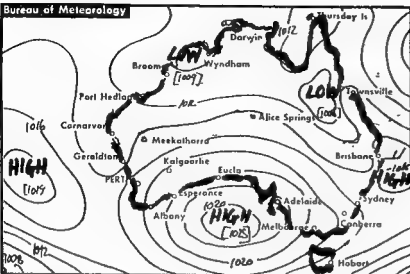
John VK6HQ, portable at Mount Adelaide, Albany, West Australia, in February 1988.

NO	STATION	DATE	TIME-S. TIME-F.	FREQ.	MODE	RST-G RST-R	NAME OTH	NOTES	QSL	
									S	R
			21.06			5-3	Chris		✓	
	VK6JI	23-1-80	21-13	Ch.5	FM	5-5	Origin Del. Albany			
			23-51			5-3	Albany	Seeking S.S.3. contacts on 144.10	✓	✓
	VK6XY	"	23-55	Ch.5	FM	5-3	Albany	2 p.		
			23-56			5-3 ¹⁰	"			
	VK6XY	"	23-59	144.10	A33	5-3	"			
						5-3	Perth		✓	✓
	VK6FM	"	00-10			5-3	Kochingham			
			00-14	144.10	A33	5-3	Don	Could not make two way contact due to my fixed beam	✓	
	VK6HK	"	00-02	144.10	A33	5-0	Wentley Town			
			00-07			5-3	Wayne		✓	✓
	VK6WZ	"	00-02	144.10	A33	5-2	Warwick			
			00-07			5-2	John	Unable to make contact		
	VK6HQ	"	00-02	144.10	A33	5-2				
			00-07			5-3 ⁺	Wah.			
	VK6KZ/P	"	00-10	144.10	A33	5-8				
			00-14			5-8	Bernie		✓	✓
	VK6KJ	"	00-14	144.10	A33	5-8				
			00-20			5-3	Jack		✓	✓
	VK6ZEL	"	00-23	144.10	A33	5-3	Triggs			
			00-23			5-1	Ken		✓	
	VK6ZFG	"	00-23	144.10	A33	5-1	Adamson			
			00-24			5-4	Jim	Called by Jim.	✓	✓
	VK6EO	"	00-27	144.10	A33	5-4	Albany			
			00-29			5-1	Wayne	Called by Wayne to check port conditions		
	VK6WD	"	00-50	144.10	A33	5-1	Warwick	called to arrange ahead		
			01-12			5-1	Via			
	VK6NL	"	00-55	144.10	A33	5-1				
			00-59			5-2	Phil	Room with 13th stage.	✓	✓
	VK6ZKO	"	01-10	144.10	A33	5-3	Perth	Gooseberry Hill		

A page from the log of Les VK5ALW, showing January 23, 1980.



Les VK5ALW (Atheistone) at the time of the big Adelaide/Perth two metre opening in 1980.



The Weather Map for Sunday, February 22, 1988 as published in *The West Australian*.

The story cycled once more in February this year. I combined a Monday training visit to Albany with the preceding weekend. As the time drew near to leave for Albany, the weather map began to look good. The heatwave in Perth was set to reach a new record and I began having visions of records of a different sort at Albany. In the event, no records were broken by VK6HQ, but, with prolonged and substantial openings on both mornings, two metres DX surpassed my wildest expectations.

As, at 7:30 am on Sunday, February 21, I sped from our accommodation on Frenchman Bay Road towards the Albany lookouts, VK6DM came up on Channel 4 1/2 Albany with the spurring news, the band was open to the east!

The sky was clear and blue and the harbour looked like an azure millpond. Would it work? Would the signal really get through? Frank had recommended the Mount Adelaide lookout in

preference to Mount Clarence, for vehicle accessibility and height above sea level so I took the right-hand fork to Mount Adelaide.

No sooner had I set the brake, taken-in the magnificent vista and scanned the repeater frequencies when in came two separate conversations, noise free. And none of the voices was an Albany VK6. This was it! Wait for a break and call sign!

I could not believe it! It was Les VK5ALW, the station who heard me in 1980 and with whom I'd not long spoken in Adelaide! Les was working Bob VK5ZRO and after I had broken in, Les could see what a series of coincidences we had shared. Both Les and Bob were as astounded as I was over the fine propagation conditions.

In the ensuing two hours I went on to work 20 VK5s and Bob VK3DEP, through the repeaters and then John VK5BJW and Eddie VK5ARL, on 146.500 MHz simplex with reports around five by

three. A big bonus was that the Perth Hills Amateur Radio Group had use of the V185WA call for the month of February and it was possible to repeat many of the QSOs using V185WA/P.

Having said I would be back well in time for breakfast and the 9:30 am WA WIA Broadcast, I had some minor experience to do to my ever patient wife, Connie.

Monday meant a full day's work and I knew there would be precious little time available for amateur radio. Nevertheless, with special dispensation from Connie, I grabbed a bite of breakfast and shot off at 7:30 am once more for the lookouts.

Climbing in altitude, I switched to VK5RAD and put the unit on CW. A tiny heterodyne showed the repeater was in use and the signal grew in strength every second until — Ouch! The Mount Adelaide car park gates were not yet open! Without bringing the car to a halt I threw a U-turn (and nearly a fit!) and back-tracked as fast as I could for Mount Clarence. Once there, by edging the car this way and that a few inches at a time, several VK3s chatting on the 146.850 MHz Mount Macedon repeater were heard free of noise but, try as I may, I could not attract their attention and raced back to Mount Adelaide. By this time, the gate was just being opened.

There was no response now from either of the Adelaide repeaters, but, with time running out, back came Trevor VK5ADY/P and Ken VK3KAV, in reply to my call on 146.950 MHz: the Mount William repeater in Victoria which rounded off things very nicely. With a quick change of reports, it was off to the office.

As a footnote, the equipment used at Albany was an FT-480R with 10 watts into a halfwave, base-fed vertical clipped onto the car rear window and just clear of the roof! (See Figure 2).

Very soon after my return to Perth I worked two of the VK5 stations (which I had worked in Albany) again, this time not on two metres but on 20 metres phone and we all remembered! It is interesting the effect DX has on people and it still seems to be one of the most popular topics for discussion.

Certainly, there is a whole host of DXers waiting at either end of the Perth/Eastern States path, eager for the *Big Duct* to come again...

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South Australia



VK5BJW

TO STATION	VK6HQ
DATE	20-288 TIME 7355 GMT
RST	5-2/3 MODE FM
FREQUENCY	146.500 MHz
XMTR	TR-751A
ANT	11 EL YAGI
POWER	25W OUT.
REMARKS	FOR QSL 20M 1-2-88 95% Faint Rpt 7000
PSE/TNX QSL DIRECT OR VIA BUREAU	

The QSL card from John VK5BJW confirming our simplex Adelaide/Albany QSO on February 20, 1988.

See next page for diagram of antenna.

KENWOOD TS-530S TRANSCIVER

Con Murphy VK6PM
PO Box 98, Yarroop, WA 6218

If you have installed the KY-88C CW filter as an extra and you have now gone on to RTTY AMTOR, you can have a 500 Hz filter in both USB and USB positions of the mode switch if you tie both posts A and B together.

For results move the IF shift to the plus side. Use the narrow position for 500 Hz. Try it and good luck!

PACKET RADIO IN THE GERMAN DEMOCRATIC REPUBLIC

During past years, packet radio has found its way into the shack of radio amateurs in the German Democratic Republic. Compared to our liberal regulations, the radio amateur of the GDR are somewhat more restricted with regard to their use of packet radio. The following is an edited translation from the July issue of the West-German amateur radio magazine *cq-DL*. Klaus Zieske DF7FB, the author of the original article compiled his information from the East-German amateur radio magazine *Der Funkamateuer* (the radio amateur).

Packet radio is an error-proof computerised RTTY mode. It allows the forwarding of messages from their originator to the receiver via several intermediate stations. These intermediate stations act as digipeaters, ie they receive packets of information and transmit them further onwards. If one wants to make use of these facilities eg because one cannot directly contact the proposed addressee of the message to be sent, one is bound to the prerequisites given below:

- 1 the use of an amateur radio station of a foreign country is illegal
- 2 any amateur radio stations acting as digipeaters must be exclusively under the direct control of the radio amateur responsible for their operation.
- 3, topic 2 and 3 do not apply to repeaters, network nodes, and satellites

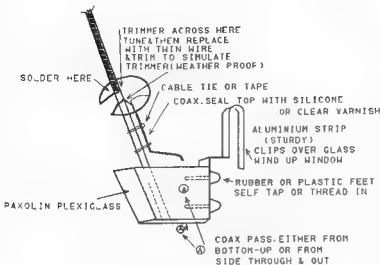
The following standards apply

Baud Rate below 30 MHz 300 Baud — above 30 MHz 1200 Baud.
Shift below 30 MHz 200 Hz — above 30 MHz 1000 Hz
Frequencies for F2B mode mark 2200 Hz — space 1200 Hz

The subjects discussed in RTTY contacts may, of course, not differ from the subjects discussed during contacts in other transmission modes. As the increased use of computers in the amateur radio service demands some changes in practice, the permissible subjects from this point of view are outlined in the following:

The operation of mailboxes requires a special licence. The application for this licence has to be directed to the Central Committee of the Society for Sport and Technic (GST) at the Ministry for Post and Telecommunication. Transmissions in one of the RTTY modes mentioned above are regarded as open (unciphered) in respect to the use of computers within the amateur radio service to the GDR. Computer programs may be broadcast, subject to the condition that their purpose is related to the amateur radio service. The use of data formats specific to a certain computer type is illegal: BASIC, FORTRAN, COBOL, PASCAL, as well as the mnemonic code and machine code of the U 880 D (similar to the 8080, the translation are regarded as open languages. If computer programs are being broadcast, the regulations are, that at the beginning and at the end of the broadcast, the purpose of the program and the programming language must be specified, using the same transmission mode that is going to be or was used to broadcast the program. Examples — Contest evaluation in BASIC, RTTY program in assembler source code U 880, filter design in PASCAL.

—Translated from *cq-DL*, July 1988, by Michael Wiegner VK5ADN



THIS ALL GOES VERTICAL WHEN CLIPPED TO WINDOW

A diagram of the window fixing for the VK4CCR two metre vertical.

Try This!

Ron Tulloch VK4BF
PO Box 718, Hermit Park, Qld. 4812

DIGITAL DISPLAY DROP- OUT IN TS-530/TS-830 TRANSCIEVERS

there is a socket labelled EXT VFO. This socket is combined with a switch, and the actual insertion of the EXT VFO automatically changes the nine volt supply from the internal VFO to the external VFO. Here is the situation where a low voltage source depends on a set of small switch contacts to get where it is supposed to be going. I have never had an EXT VFO, so it is possible to assume that a combination of time, dust and humidity would result in the build up of a high resistance joint to the low voltage, thus disabling the VFO and therefore being the primary cause of the fault.

A couple of minutes spent manually operating the switch on the EXT VFO socket, duplicated the fault every time, so in connection with some cleaning spray, effectively cleaned the switch contacts, and allowed the nine volts to get to the internal VFO.

I now know what I am going to do "when I get around to it!". I have no intention of using an external VFO, so I am going to bypass this switch on the EXT VFO socket, and take the nine volts directly to the internal VFO where it rightly belongs.

Hopefully the above comments will be of assistance to others who own TS-530/TS-830 equipment, and allow you to use this otherwise "no-frills" equipment for a long time to come!

Have other amateurs experienced this frustrating fault on an intermittent basis?

This fault manifests itself when, without any warning during normal operation, the digital display just drops right out, and the set goes quite dead except for some slight audio noise from the speaker.

It had been happening with my TS-530S on and off for around two years, and the only advice I could get from other amateurs with the same fault was to "take the top cover off, and push and prod the wires and plugs to the display board a few times, and all would be well!"

This did work after a fashion, and the set would again come to life and operate for a couple of months or so, and I never came away from this exercise really sure of what I had actually done to overcome the problem.

The last episode happened recently, and no amount of pushing and prodding would cure the problem, so I thought there must be a logical reason for this. Out came the trusty multi-meter, along with the owner's manual, and the confusing circuit diagrams that seem to be the norm with all owner's manuals.

After about an hour's eye strain tracing out the power leads to the boards through the maze of parallel lines on the circuit diagram, and the bundles of connecting wires in the set, I felt I had come up with the answer.

There is no control on the front panel for changing from the internal VFO to the external VFO. Right at the back and rear of the chassis

RECEIVER LARGE SIGNAL PERFORMANCE

John Day VK3ZJF

5-7 Old Warrandyte Road, Donvale, Vic. 3111

Vast improvements have been made!

Recently, I have heard on-air, and seen written, some rather horrifying misconceptions about the nature of in-band interference. Many people have assumed that because they are experiencing interference from a fellow amateur operating nearby that his transmitter is at fault. On many occasions it is, but in as many more occasions, the problem lies in the receiver.

When a receiver or transceiver is being designed, several compromises are inflicted on the final specification of the product. Given the price people will be prepared to pay for a given level of features, what money is left over for the performance. Secondly, what level of performance do we offer for that amount of money, thus influencing the ultimate profit from the product.

A detailed study of modern transceivers will reveal that, whilst vast improvements have been made in the features and facilities offered on modern equipment, relatively little improvement has been made in the specifications of the equipment. Only when amateurs start selecting equipment on the basis of superior performance will the manufacturers start designing superior equipment.

RECEIVER SPECIFICATIONS

As in all electronics, the performance of one piece of equipment can only be compared with another when a set of definable specifications are used. Perhaps now is a good time to explain some of the more important specifications in evaluating receivers and some of the characteristics which determine the performance of a receiver.

SENSITIVITY

When evaluating receivers, some basis of comparison must be established. This is generally accepted to be a 10 dB output signal to noise ratio. Thus a receiver will generally have its sensitivity quoted as X μ V or xxx dBm for 10 dB S/N ratio.

The actual amount of signal required to achieve this 10 dB S/N ratio is determined by the noise figure of the receiver. Noise figure can be said to be the ratio by which the receiver or other "something" degrades the input signal to noise ratio. Noise figure is measured by using a noise source that generates a known amount of "excess" noise over and above that calculated for the object at room temperature.

Noise is used rather than a single signal because the excess noise will then be measured in the same receiver bandwidth as the internal noise. Firstly, the output of the receiver is measured without the noise source turned on. Then the source is turned on and the increase in output is noted. Noise sources for this sort of work are calibrated in terms of excess noise ratio, thus if the noise source had an excess noise ratio of 30 dB and the output of the receiver increased only 15 dB when it was

activated then the receiver must have a noise figure of 15 dB, a not uncommon figure for an HF receiver.

Combining all of this information, we can say:

* For an output S/N ratio of 10 dB, this receiver will need an input S/N ratio of 25 dB due to its 15 dB Noise Figure.

* For the 3 kHz bandwidth suggested above for an SSB receiver, the signal must be -139 dBm (base noise) + 25 dB = -114 dBm (0.9 μ V).

A not uncommon specification for a high frequency receiver. Another useful figure to remember is one known as the receiver's "input self noise". This is the apparent noise level at the input to the receiver and is equal to the base noise power (-139 dBm in this case) plus the noise figure. Thus, in this example, the input self noise of the receiver is -139 dBm + 15 dB = -124 dBm. This is sometimes also referred to as the "mids" or minimum detectable signal level.

"Suppose I was a new chum in all this amateur radio game and I came to you and said that I was having trouble hearing weak stations when other stronger stations are on the same band. What would you say?"

"I would say that you had accidentally discovered one of the most important, yet least talked about specifications of a receiver. One which is of immense importance in being able to utilise the sensitivity and noise figure we have already talked about."

DYNAMIC RANGE

Whilst the noise figure and thus the sensitivity of the receiver are useful indications of the very weak signal performance of a receiver, they tell us absolutely nothing else. Two things are of concern in respect of the large signal handling capability of a receiver.

* The ability of the receiver to handle a single large signal in the passband. (A very strong desired signal) and ...

* The behaviour of the receiver in the presence of strong undesired signals.

The first is directly related to the dynamic range of the receiver. In an SSB receiver we have automatic gain control circuits which reduce the gain as the signal level increases so as not to overload the following stages. Thus, if a receiver has a sensitivity of 1 μ V (-113 dBm) and will tolerate a maximum of one volt before overloading, then it must have a dynamic range of 120 dB.

Overloading of the receiver in the presence of a single large signal is only one measure of the dynamic range of the receiver. What it does in the presence of several large signals is extremely important. In today's crowded HF bands and with so many more amateur operators crowded into the limited HF band space we are

more and more likely to have several large signals in our receivers passband at one time.

To treat dynamic range in isolation is to walk into a trap. Dynamic range can only be usefully defined when an additional set of qualifying parameters is given. Dynamic range when simply stated as above will tell us only the range of signal inputs over which the receiver can operate with no other input signal present, a situation which, we would all agree, is relatively unlikely to occur. A more useful guide would be to determine the ability of the receiver to receive a low level signal in the presence of a nearby high level signal. This measure of performance is known as the third order intermodulation qualified dynamic range shortened to intermodulation dynamic range and abbreviated to DR3.

Obviously, to define and understand the DR3 method of dynamic range specification, we must understand intermodulation itself.

INTERMODULATION

When two signals are introduced into a non-linear stage they combine to produce one or more new frequencies, these are known as intermodulation products. These products occur at spacings equal to that of the original signals. Let us suppose we have a receiver listening on 8 MHz, if interfering signals of 4 and 12 MHz were present a "spurious" signal would be heard, the difference between 12 and 4 being 8. This is known as second order intermodulation distortion. Fortunately, second order effects (and higher odd orders) are of little concern, because the large interfering signals are so far from the desired signal they are usually eliminated by passive filtering at the input of the receiver.

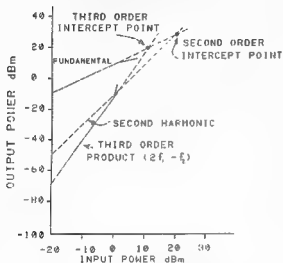
What does concern us however, is the third order intermodulation distortion and to a lesser extent, the higher odd orders, 5, 7, and 9. If we have two large input signals at frequencies f1 and f2 we will get third order products of 2f1 - f2 and 2f2 - f1. The problem with this third order IMD is that the products can very easily be very near or even within the passband of the receiver, thus they are not as easy to cope with as second order products. For example, with our 8 MHz receiver and interfering signals at 9 and 10 MHz we have 2 x 9 - 10 = 8. An undesired signal smack in the middle again.

INTERCEPT POINT

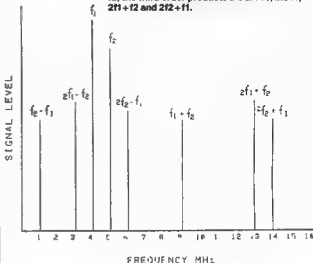
A detailed mathematical analysis of the non-linear behaviour of amplifying and other stages was undertaken by Franz McVay, and in 1967 he wrote an article called *Don't Guess the Spurious Level*.

During his work, McVay developed the concept of an intermodulation distortion intercept point. Let us state a rule without doing all the mathematics behind it. The intermodulation products of order N increase in amplitude at a

Intermodulation Intercept Graph:
Relationship between and output signals showing the intercept point concept.



IMD3 Spectral Display: Second and third order intermodulation distortion products. f_1 and f_2 are the two signal frequencies, second order products shown are $f_2 - f_1$, $f_1 + f_2$, the third order products are $2f_1 - f_2$, $2f_2 - f_1$, $2f_1 + f_2$ and $2f_2 + f_1$.



rate of N dB for each 1 dB of increase in input signal level and the level at which the intermodulation products equal the desired signal shall be known as the intermodulation intercept point.

Obviously, if the level increased sufficiently, the distortion products would increase to a level equal to that of the output signal. If we graph the input and output levels for the desired signal and intermodulation product we see:

It is important to bear in mind that the power levels indicated are per signal. Usually IMD testing is done with a two-tone or two signal signal using two signals close together. In this case, the third order products can be seen either side of the desired signals.

In the graph above, we have shown the output level increasing at a constant rate, unfortunately this is not the real case. Real amplifiers 'saturate' or suffer an inability to increase output to provide

more output for more input. Usually we specify amplifier performance at the 1 dB compression point. This is where the gain of the amplifier departs from the linear relationship by 1 dB.

If we wish to use an amplifier over its optimum range then we should hopefully not exceed the 1 dB compression point. Whilst audibly obvious distortion of the demodulated signal will not be noticeable at this point, it isn't far away!

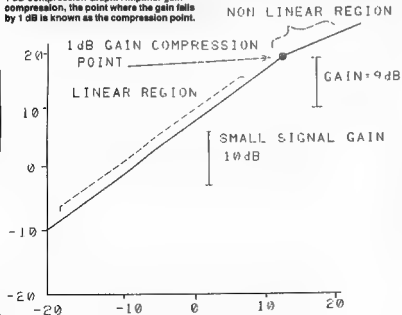
When measuring an amplifier, it is normal to first measure the 1 dB compression point, then at some input level below this, commonly 10 dB, measure the IMD3 level. From this measurement of IMD3 below desired signal, we can then directly calculate the IMD3 intercept point: eg: Pin for 1 dB compression is +10 dBm.

Pin for tones is 2 x 0 dBm.
IMD3 products are -60 dB at that level.
Intercept point = output level in a desired tone + half the difference between desired output and distortion products or, in this example, $0 \text{ dBm} + 1/2(60 \text{ dB}) = +30 \text{ dBm}$.

In respect of receiver specifications, the third order intercept point will allow us to calculate an all important but very rarely quoted parameter **IMD Dynamic Range**. IMD dynamic range is a measure of the ability of the receiver to receive weak signals in the presence of strong out-of-band signals. If a pair of signals located outside the passband have an IMD product appearing in the passband of the receiver, its sensitivity will be degraded by the interfering signal. Since the ear can recognise a desired signal at or just below the noise level, one way to specify the dynamic range is to state how far above the noise level each of the two interfering signals are when the IMD product causing the interference is equal to the noise level.

Like sensitivity which was discussed above, the **IMD dynamic range** (abbreviated **DR3** for Dynamic range, third order) is dependent on receiver bandwidth since noise power is proportional to receiver bandwidth, as the input noise power is:

1 dB Compression Graph: Amplifier gain compression, the point where the gain falls by 1 dB is known as the compression point.



N = KTBFG
where
F = Noise factor
G = Receiver gain

For convenience we can arrange this to work in decibel units. Let us say that the receiver third order intercept point is IMD3 above the noise level. Since the third order slope is three, the upper signal input level of a two signal input producing IMD products at the noise level will be IMD3/3 below the intercept. Thus the DR3 can be calculated from

$$DR3 = \frac{2(IMD3 - KTBFG)}{3} \text{ dB}$$

where KTBFG is in decibel power units.

For example, we have a receiver with the following characteristics.

Noise figure	12 dB
Bandwidth	3 kHz
IMD3 intercept point	+20 dBm
(a fairly common value)	

Therefore,	
Receiver input self-noise	-127 dBm
	= (-139 + 12) dBm

Then the IMD dynamic range will be:

$$2(-20 - (-144 + 5 + 12))$$

$$DR3 = \frac{3}{3} \text{ dB}$$

or, in real terms, a pair of out of passband interfering signals of -29 dBm each will produce a third order IMD product in the passband equal to the input self noise of the receiver.

We must be careful in this case to ensure that the measurement is truly performed outside the passband. Remember that the IF filter has a finite slope and ultimate sensitivity. For convenience, close in IMD measurements are usually performed at ± 30 to 50 kHz from the desired frequency.

"Surely there must be some compromises and some costs in all of this. Can you have a receiver with good sensitivity, good dynamic range and at a reasonable price?"

To answer that question we really must know a little more about receivers and how they are built. But I suppose in essence the answer is, yes you can.

SUMMARY

Whilst we have now considered many of the problems encountered in specifying a receiver, let us look at what the manufacturers tell us. Why don't you go away and look at the data on your own receiver or transceiver and consider how well it might perform in relation to a high-performance receiver, as well as considering how much the manufacturer might not be telling you.

References

- "Single Sideband Systems and Circuits" Sabin and Schoenitz (Editors). McGraw-Hill 1987
- "Communications Receivers, Principles and Design" Rohde and Bucher. McGraw-Hill 1988.
- "Solid State Design for Radio Amateurs" Hayward and deMaw, ARRL, reprinted 1988
- "Dynamic Range, Intermodulation and Phase Noise" Chadwick. Radio Communications, March 1984.
- "Don't Guess the Spurious Level" McVay. Electronic Design, February 1, 1987, pp 70-73.
- Many other useful contributions have appeared in VHF Communications specifically in relation to VHF/UHF receiver performance and in VHF/UHF Techniques, Ham Radio magazine, by Joe Reisert W1JR, over many years. Dr Ulrich Rohde, one of the leading writers on receiver design has had a number of articles in Ham Radio over many years, they are worth seeking out!

© John Day 1988

FRANCESCO COSSIGA IOFCG PRESIDENT OF THE ITALIAN REPUBLIC

During the Bicentennial year, Australia has been host to many visiting heads of State and Prime Ministers of various governments.

Many of these dignitaries came also to represent their country at the various National Days at the Brisbane Expo.

The latest such visit was by Francesco Cossiga, President of the Italian Republic. Between October 11 and October 16, 1988, the President visited Canberra, Brisbane, Adelaide, Melbourne and Sydney.

Very few of our fellow amateurs know that the President is a radio amateur. His call sign is IOFCG and he is listed in the International Call Book.

To celebrate his visit, the WIA New South Wales Division made him an Honorary Member of the Division for the month of October 1988, during his stay in Australia.

Unfortunately, his high office and protocol prevented the representatives of the NSW Division to meet the President personally.

On behalf of the Australian radio amateur and radio amateurs of Italian origin in Australia, a framed Honorary Membership Certificate and various WIA mementos were given to Dr G. Cossiga, the Consul General of Italy, with a request to give them to this distinguished amateur.

—Contributed by Stephen Hall VK2PS

POSTSCRIPT TO ICOM IC-32AT REVIEW

This versatile hand-held transceiver for both the two metre and 70 centimetre bands was reviewed in AR for October 1988 on pages 18 and 19.

The reviewer commented critically on the poor quality from the built-in speaker, but indicated that audio was normal from an external speaker plugged into the socket provided.

Upon return to Icom, the internal speaker was checked and found to be damaged, although the set had been working perfectly when it first left Icom. The actual time and cause of the speaker becoming defective is impossible to ascertain, but we would like to make clear that the reviewer's criticism applied only to this one set as he found it (at that time the only one in Australia), and was meant to emphasise that poor audio is not characteristic of Icom equipment.

We apologise to anyone who has been affected by this misunderstanding.

in VK6 for

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A TRIBAND DELTA LOOP ANTENNA

Bob Hancock VK5AFZ

30 Tottenham Court Road, Port Elliot SA. 5114

This may be the solution to your antenna problems!

The major problem in constructing multiband quad-type antennas is the difficulty in achieving a sufficiently rigid yet lightweight structure, then getting it up in the air and keeping it there. Having constructed and repaired a number of quads over 10 years, ranging from a 10/15 metre two-element cubanador to a 10/15/20 metre four-element tribander, I have often pondered how the standard design could be made easier to handle.

The first criterion was that the antenna should be simple to gain access to for minor adjustments. Although most quads will produce a reasonable signal without critical tuning, there is nevertheless not much point in having a large antenna which is not operating at its optimum efficiency — you may as well use something simpler and smaller. But, if you are faced with a major operation like tilting a tower with a large quad on top, there is not much incentive to "fiddle" with the tuning for optimising front-to-back ratio, forward gain, SWR, etc.

The second major headache with large quad-type structures is the relatively high wind loading on the multitude of spreaders which can cause the antenna to thrash about like a wounded octopus in a slight gale. This leads to broken wires and loosening of spreader clamps, so that eventually it has to come down again for repairs.

Obviously many other amateurs have looked at these problems, and one of the designs often chosen is the delta loop configuration. Usually this is mounted with the triangle apex downwards and fixed to a supporting boom, and a strong lightweight structure can be produced. There still remains the problem of getting it up and down because of the large volume of free space needed to manipulate the antenna.

One solution to this has been supplied in the design by GW2DDX, which uses a pulley and halyard system to raise the structure on a mast, and a light H-shaped spreader to hold the base of the loop open. (See Figure 3).

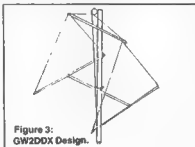


Figure 3:
GW2DDX Design.

Looking at the GW2DDX design, it quickly became apparent that the lower spreader could be eliminated by using light guy ropes to hold the loops open. If these were continued up to the centre point of the supporting spreader, additional loops could easily be incorporated into the structure, to produce a triband array. (See Figure 1).

With this type of construction, the whole antenna can be laid out and assembled on the ground at the base of the mast, and then hauled into the air in a 'collapsed' state, which is a very simple operation. Then the four spreader ropes are stretched into position to open out the loops, and secured to the guy anchor points.

If tuning adjustments are required, it is simply a matter of lowering the halyard until the elements are within reach, making the modifications, and hauling it back up the mast.

When it is required to rotate the array, it is necessary to have movable guy anchors with a quick-release attachment for the ropes. The guy ropes are disconnected and the antenna walked around until the top spreader is pointing in the right direction. The anchors are then relocated in the new position and the ropes re-attached to them. If you have soft enough ground, tent pegs are ideal, otherwise you could use a large brick, bucket of sand, etc. The system requires a "turning circle" of about 11.5 metres on the ground. (See Figure 2), but if you have a few obstructions, there is no problem in moving the antenna past them because it is not a rigid structure. Likewise, some of the "obstructions" could be utilised as guy anchor points.

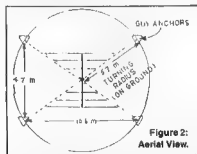


Figure 2:
Aerial View.

Table 1 shows some suggested dimensions for a 10/15/20 metre triband system taken from information in William Orr's *All About Cubical Antennas*. Loops for other bands could also be added.

Table 1.

DIMENSION /mm	20 m D E REF	15 m D E REF	10 m D E REF
Side of Loop	7191	4817	3583
	7370	4937	3672
Distance from Centre			
— Top Spreader	1587	1063	791
	1587	1063	791
— Guy Ropes	7364	4932	3669
	7539	5050	3756

Figure 1.

AIR CORED COIL CALCULATION PROGRAM IN G W BASIC

Keith Angrave VK3BVK

50 Fischer Street, Torquay, Vic 3228

A simple BASIC program for calculating air cored coils.

Despite the coming of "Black Box" operating in most shops these days, I still feel the need to be able to build some form of device and get it working correctly. This invariably leads to calculation of some form of resonant circuit and you can guarantee that the battery in the calculator is flat again or the sliderule is missing!

The program listed seems to fit my requirements for air cored coils quite well although entry of the figures for higher frequencies may seem a little messy, ie 432.2 comes out as 432200. very easy to lose a digit.

It is written in GWBASIC using a Micro-Buff PC Turbo, but should work just as well in

"ordinary" BASIC on your favourite machine. There are no fancy tricks used in the various routines as I am not the world's best programmer, by any means.

The program has been divided into several subroutines with space left between for any additions that the individual may like to add. Lines 100 to 280 select which option to use. Note that in Option 6 I have returned to the operating system at line 1480. In my case, I am using MSDOS 3.2 and have batch files to select whatever program needed for a particular requirement. If needed, it is possible to change line 1480 to an END statement.

Lines 400 to 500, 600 to 700, 800 to 920 are the subroutines for options 1, 2 and 3 respectively. Each of these options use lines 510 to 580 as a common routine to output the results to a standard Centronics parallel printer port.

Lines 1000 to 1160 and 1300 to 1450 are the subroutines for Options 4 and 5. Again a common print routine is employed for these two options at lines 1170 to 1250.

A printout of the results of calculations for each option is included in this article so to prove the program buy a new battery for the calculator and compare results. You will find that it works!

ar

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ADP 11/82

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10 REM a series of programs for the calculation of components required
20 REM to resonate at a particular frequency with aircored coils
30 REM data for calculations extracted from 1982 ARRL handbook
40 REM compiled by R.L.Ingrate VE3BVL.18/03/88.
90 CLS
100 CLS:PRINT:PRINT TAB(25)"RESONANT CIRCUIT CALCULATIONS"
110 PRINT:PRINT TAB(20)"*****"
120 PRINT TAB(20)"*   SELECT REQUIRED OPTION   *"
130 PRINT TAB(20)"*   1.To find Frequency with L/C Known   *"
140 PRINT TAB(20)"*   2.To find Capacitor with P/L Known   *"
150 PRINT TAB(20)"*   3.To find Inductance with F/C Known   *"
160 PRINT TAB(20)"*   4.To find Number of Turns for Coil   *"
170 PRINT TAB(20)"*   5.To find Inductance of Coil with   *"
180 PRINT TAB(20)"*   turns/radius/length known   *"
190 PRINT TAB(20)"*   6.To return to system   *"
200 PRINT TAB(20)"*   "
210 PRINT TAB(20)"*****"
220 INPUT S1$
230 IF S1$="1" THEN 400
240 IF S1$="2" THEN 600
250 IF S1$="3" THEN 800
260 IF S1$="4" THEN 1000
270 IF S1$="5" THEN 1300
280 IF S1$="6" THEN 1460
290 REM
400 CLS:PRINT TAB(70)"Find resonant frequency knowing L&C (Option 1)"
410 PRINT:PRINT "F is frequency in Kilohertz"
420 INPUT "Enter Inductance in Microhenries":L1
430 INPUT "Enter Capacitance in Picofarads":C1
440 F1=10^12/((1/(PI*6.28)*(L1*C1)))
450 PRINT TAB(25)"Resonant Frequency is":F1;"Kilohertz"
460 PRINT TAB(25)"Inductance =" :L1;"Microhenries"
470 PRINT TAB(25)"Capacitance=":C1;"Picofarads"
480 INPUT"Run this option again Y/N:R1$ IF R1$="Y" OR R1$="Y" THEN 400
    ELSE 490
490 INPUT"Do you want a printout of the results Y/N:P1$
500 IF P1$="Y" OR P1$="Y" THEN 510 ELSE 90
510 LPRINT:LPRINT
520 LPRINT"Results of your calculations from the data given for Option
    ":S1$:"
540 LPRINT:LPRINT TAB(25)"Frequency of Resonance is":F1;"Kilohertz"
550 LPRINT TAB(25)"Inductance of Coil is":L1;"Microhenries"
560 LPRINT TAB(25)"Capacitor required is":C1;"Picofarads"
570 INPUT"Do You Want More Hardcopy Y/N:R1$
580 IF R1$="Y" OR R1$="Y" THEN 510 ELSE 100
600 CLS:PRINT TAB(20)"Find value of C knowing Frequency and Inductance
    (Option 2)"
610 PRINT:PRINT
620 INPUT"Enter Frequency in Kilohertz":F1
630 INPUT"Enter Inductance in Microhenries":L1
640 PRINT"C will be Capacitance in Picofarads"
650 C1=10^12/((PI*6.28)*(F1*6.28))^2*L1
660 PRINT TAB(25)"Resonant Frequency is":F1;"Kilohertz"
670 PRINT TAB(25)"Inductance=":L1;"Microhenries"
680 PRINT TAB(25)"Capacitance=":C1;"Picofarads"
690 INPUT"Run this option again Y/N:R1$
700 IF R1$="Y" OR R1$="Y" THEN 600 ELSE 710
710 INPUT"Do you want a printout of the results Y/N:P1$
720 IF P1$="Y" OR P1$="Y" THEN 510 ELSE 90

```

```

800 CLS:PRINT TAB(20)"Find value of L knowing Frequency and
    Capacitance (Option 3)"
810 PRINT:PRINT
820 INPUT"Enter Frequency in Kilohertz":F1
830 PRINT"L will be Inductance in Microhenries"
840 INPUT"Enter Capacitance in Picofarads":C1
850 L1=10^12/((PI*6.28)*(F1*6.28))^2*C1
860 PRINT TAB(25)"Resonant Frequency is":F1;"Kilohertz"
870 PRINT TAB(25)"Capacitance=":C1;"Picofarads"
880 PRINT TAB(25)"Inductance required is":L1;"Microhenries"
890 INPUT"Run this option again Y/N:R1$
900 IF R1$="Y" OR R1$="Y" THEN 800 ELSE 910
910 INPUT"Do you want a printout of the results Y/N:P1$
920 IF P1$="Y" OR P1$="Y" THEN 810 ELSE 90
1000 CLS:PRINT TAB(20)"Find number of turns for a coil given L,radius
    and length (Option 4)"
1010 PRINT TAB(25)"L=inductance of coil in microhenries"
1020 PRINT TAB(25)"a=Coil radius in inches"
1030 PRINT TAB(25)"b=length of coil in inches"
1040 PRINT TAB(25)"n Will be the number of turns required"
1050 INPUT"Enter coil radius in inches":A1
1060 INPUT"Enter coil length in inches":B1
1070 INPUT"Enter coil inductance in microhenries":L1
1080 N1=(SQRT(L1*(9*A1)+(10*B1)))/A1
1090 PRINT TAB(25)"Coil Inductance is":L1;"Microhenries"
1100 PRINT TAB(25)"Coil radius is":A1;"inches"
1110 PRINT TAB(25)"Coil length is":B1;"inches"
1120 PRINT TAB(25)"Number of turns=":N1
1130 INPUT"Run this option again Y/N:R1$
1140 IF R1$="Y" OR R1$="Y" THEN 1000 ELSE 1150
1150 INPUT"Do you want a printout of the results Y/N:P1$
1160 IF P1$="Y" OR P1$="Y" THEN 1170 ELSE 90
1170 LPRINT:LPRINT
1180 LPRINT"Results of your calculations from the data given for Option
    ":S1$:"
1200 LPRINT TAB(25)"Number of turns required is":N1
1210 LPRINT TAB(25)"Coil Radius is":A1;"inches"
1220 LPRINT TAB(25)"Coil Length is":B1;"inches"
1230 LPRINT TAB(25)"The inductance is":L1;"microhenries"
1240 INPUT"Do you want more hardcopy Y/N:R1$
1250 IF R1$="Y" OR R1$="Y" THEN 1170 ELSE 90
1300 CLS:PRINT TAB(20)"Find inductance of coil given turns,radius and
    length (Option 5)"
1310 PRINT TAB(25)"L will be inductance of coil in microhenries"
1320 PRINT TAB(25)"a=Coil radius in inches"
1330 PRINT TAB(25)"b=Coil length in inches"
1340 PRINT TAB(25)"n=number of turns"
1350 INPUT"    Enter coil radius in inches":A1
1360 INPUT"    Enter coil length in inches":B1
1370 INPUT"    Enter number of turns":N1
1380 L1=((A1*A1)*(N1*N1))/((9*A1)+(10*B1))
1390 PRINT TAB(25)"Coil radius=":A1;"inches"
1400 PRINT TAB(25)"Coil length=":B1;"inches"
1410 PRINT TAB(25)"Inductance of coil is":L1;"microhenries"
1420 INPUT"Run this option again Y/N:R1$
1430 IF R1$="Y" OR R1$="Y" THEN 1300 ELSE 1440
1440 INPUT"Do you want a printout of the results Y/N:P1$
1450 IF P1$="Y" OR P1$="Y" THEN 1170 ELSE 90
1460 STOP

```

RF IMPEDANCE MATCHING USING FERRITE TOROIDAL CORES

Part 4: CONSTRUCTION AND TESTING

Stephen Bushell VK3HK
74 King Parade, Knoxfield, Vic 3180

1. CORE PREPARATION

Before commencing construction, the first operation one should perform is the marking of the core body to facilitate later identification. There is bound to be some future use for these cores and unless they are identified now, the results of the next application will be uncertain.

Depending on which manufacturer's core is used and what part of the range it represents, there will be quite a variation of finish ranging from smooth, colour-coded enamelled surfaces to the basic uncoated abrasive raw material.

In the case of the former finish, no surface preparation is required. With the latter however, it is essential to wrap the core with a protective covering in order to avoid damage to the enamelled winding wire during assembly. Virtually any non-conductive material may be used for this purpose. The cheapest by far is PVC tape. A word of warning however, especially if the assembly is to be used outside. Unless the transformer is mounted in a water/dust proof container (IP56) or the entire assembly is potted, the adhesive backing of the PVC tape will soon deteriorate and expose the enamelled wire and core to the elements with consequent deterioration and failure being inevitable.

A more durable and generally useful tape is EPR (ethylene/propylene/rubber) which has a high voltage rating in excess of 1000 volts, a temperature rating of 130 degrees Celsius (PVC is generally rated at 75 degrees Celsius) and, most importantly, has a self-healing characteristic which eliminates the need for an adhesive backing.

To use, the tape is simply stretched and wound about the item to be covered. The individual layers after a few minutes combine to form a single piece seal.

Yet another method of protection is to paint or varnish the core. If it is painted, don't forget to identify the core after the paint has dried.

With low powered units, insulated hook-up wire or sections of ribbon cable may be used as the windings and can be applied directly to the untreated core.

2. WINDING

Prior to commencement of winding it must be ascertained the length of wire required. One method is to wind a piece of string, the required number of turns, about the core. Add 10 percent more, plus the length of tails (ends). This saves wasting wire and the dissatisfaction of having to

In previous articles we have discussed three commonly employed transformer families and some basic circuit formats used in impedance matching. This month we will consider assembly methods and performance testing, concluding with a farrago of circuits.

rewind because of insufficient wire to complete the necessary number of turns.

Windings may be laid flat about the core with the wires running parallel with respect to each other, or they may be twisted together prior to assembly and applied to the core as a single winding. See Figures 1 and 2.

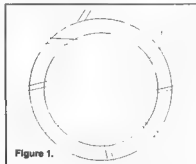


Figure 1.

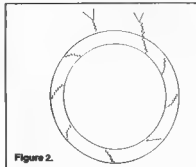


Figure 2.

Whatever method is used, the windings should be spaced evenly over at least five-eighths of the core body. If, in the case of multiple circuits occupying a single core, each circuit should share an equal proportion of the core body. See Figure 3.

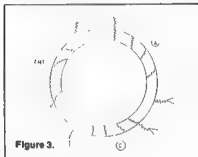


Figure 3.

3. TWISTED MULTIFILAR (stranded) WINDINGS

These are often more easily applied and, in case of transmission line and auto-transformers, provide for a more efficient power transfer than the flat parallel formation. Identification of windings is initially more difficult with this method but may be overcome by testing with a multimeter and then marking to suit individual requirements.

4. CIRCUIT NOTATION

The three types of transformers discussed are all drawn according to commonly accepted protocol. One difference however is the placement of a dot beside the windings to indicate the phasing or commencement of the winding. See Figure 4.

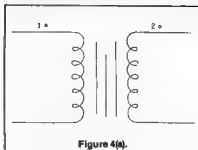


Figure 4(a).

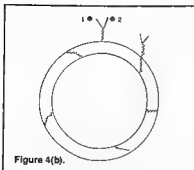


Figure 4(b).

Take into account that which has preceded and apply the wire to the core. See Figure 5.

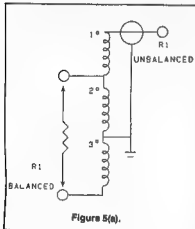


Figure 5(a).

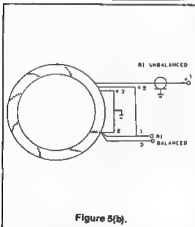


Figure 5(b).

Transformer details.
TYPE — 11 balanced to unbalanced auto-transformer
WINDING — 1 trifilar winding tapped at the junction of the first and second windings and at the junction of the second and third windings.
CORE — FC564*, 43 Mix Amidon — FT140.
WIRE — Enamelled #20 — Metric equivalent 1 mill metro
TURNS — 8 turns.
POWER — 100 watts PEP This power rating coincides with the majority of transceivers currently in use in Australia and New Zealand.

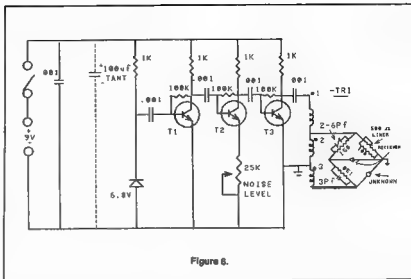


Figure 6.

FREQUENCY — 1 to 30 MHz

* Core coding of Stewart Electronics: Cost of core approximately \$5 to \$10 each plus tax

The balun would make an ideal addition to a G5RV antenna providing correct balance of current between the coaxial cable (unbalanced) feed and the 300 ohm ribbon (balanced) stub and would, without doubt, improve the radiation pattern of the antenna by correcting the current phasing of each leg of the dipole flat top.

NOTE: Although the nominal impedance of television ribbon is 300 ohms, because of the operation of the cable as a quarter wave stub in the G5RV, the reflected impedance at the junction of the ribbon and the coaxial feeder is about 75 ohms when the antenna is operated on its centre design band of 20 metres. This impedance alters from band to band, the difference showing as a VSWR of greater or lesser degree depending on the adjustments made by the flat top.

6. TESTING

After constructing a transformer one may wish to test it for bandwidth and circuit integrity. Did we put it together correctly?

The least complicated test is to inject wideband RF noise into the transformer input. The output of the transformer is terminated in a resistance of similar value to the impedance of the load which will be placed on it in operation. A check of voltage transfer with respect to impedance transformation stability over the required frequency range is achieved by using a noise bridge in conjunction with a receiver to cover the frequency range under test. See Figures 6 and 7

T1, 2, 3 BF198 or similar

TR1 1:1 balun wound on FC470*, 77 Mix Amidon — FT50, using a bifilar winding consisting of windings one and two and a single winding for three.

Enamelled wire, SWR #20 or metric 1 millimetre using six turns per winding will allow operation over the range 1 to 30 MHz.

The transformer should be wound according to the following. . . . Both windings must be wound in the same direction. The bifilar winding occupies the opposite half of the core body to the single winding.

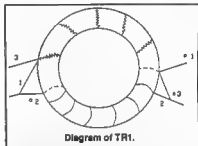


Diagram of TR1.

R1 should be a 500 ohm linear taper carbon or plastic film potentiometer

*C. 100 Mfd tantalum required if external power supply is used.

FC470 Stewart Electronics stock number.

7. TESTING METHOD

Assuming that the noise bridge is operating correctly and has been calibrated

a) Connect the bridge and transformer according to Figure 7. R1 should be selected according to the load impedance to be used in the actual circuit, eg a dipole antenna equals 75 ohms.

b) Set the noise bridge noise-level control to maximum and adjust the balance (resistance) to the known resistance (R)

c) Set the receiver AGC to fast or disable it

d) Set the receiver to the lowest frequency of interest

e) Null the bridge as indicated on the receiver S-meter or by the receiver noise level. The position of the balance control when the null is greatest should coincide with the value of the load resistor (R) — given that we are testing a 1:1 transformation ratio. If the balance reading is not close to R, you have wrongly assembled the transformer, the core or the number of turns are not suitable for your lowest frequency.

f) Carry out the same test as step e), at mid-frequency and top-frequency and note the position of the balance control at null. If your load resistance value R coincides with the noise bridge balance control at null for bottom, mid and top frequencies, you are ready for the next step which is to put the transformer into service

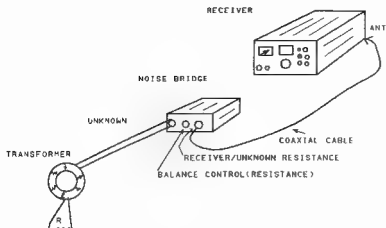


Figure 7.

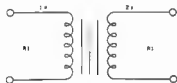


Figure 8 (a).

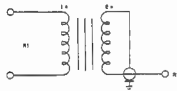


Figure 8 (b).

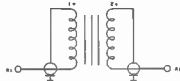


Figure 8 (c).

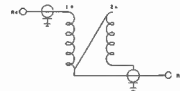


Figure 8 (d).

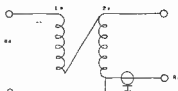


Figure 8 (e).



Figure 8 (f).

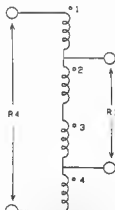


Figure 8 (g).

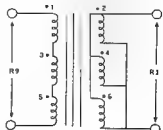


Figure 8 (h).

6. CIRCUITS

9. CONSTRUCTION DETAIL.

All my transformers were designed for use in the range 1 to 30 MHz. I concentrated on two power levels to facilitate the two ranges provided by barefoot operation and add-on linear usage. With 100 and 400 watts PEP output respectively,

	100 WATTS	1000 WATTS
Core type	FC564*	FC518*
	Amidon	Amidon
	FT104-43	FT240-77

Wire size 1 mm ϕ SWG #20 1.25 mm ϕ SWG #20

Core cost* \$6.18 plus tax \$22.30 plus

Neither core showed any sign of heating whatsoever. The #43 core mix was selected for its wideband frequency range, 1 to 50 MHz and its medium flux saturation of 2750 Gauss.

The #77 core mix was selected for its wideband frequency range .5 to 30 MHz and its high flux saturation of 4800 Gauss.

* Stewart Electronics stock number and pricing. Stewart Electronics, 44 Stafford Street, Huntingdale, Vic. 2106.

Electronic Components

Brand new components, manufacturer's surplus, at vastly reduced prices.

Diode, 1N4148	10 for 50c
Zener, 4V7, 5V1, 5V8, 6V2, 8V1, 12V	10 for 50c
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BY164 bridge, 1.2A, 120V pk, pcb mounting	60c
LED red, round	15c
8C538 npn 1A, 800mW audio	10 for 95c
8D132 prep medium power, TO18	50c
8DX77 npn high power 8A, 60W, TO220	75c

3F960 low noise dual gate FET	5 for 95c
5D1013 npn VHF, 10W at 28V, 10dB gain	\$2.50
3N5634 npn VHF, 40W at 28V, 7.5dB gain	\$9.95
8S170 Vmos N-channel FET, 30V	30c
VN88AFA, Vmos FET, 80V, 1.5A	140c
7806 Regulator, +8V output, TO220	50c
7808 Regulator, -8V output, TO220	50c
TEA1043 DTMF Generator IC	95c
LM324 Quad op amp, +/-1.5 to 16V supply	40c

4C118 CMOS Quad 2 Input NAND gate	30c
10138 CMOS Dual D-type Flip Flop	40c
40158 CMOS Dual 4-bit Shift Register	60c
40168 CMOS Quad analogue switch	30c
40208 CMOS 14-stage binary counter	60c
40238 CMOS Tripple 3-input NAND gate	30c
40278 CMOS Dual JK Flip Flop	40c
40498 CMOS Hex Inverting buffer	30c

40508 CMOS Hex non-inverting buffers	60c
40568 CMOS Quad analogue switches	40c
40718 CMOS Quad 2-input OR gate	30c
40818 CMOS Quad 2-input AND gate	30c
40838 CMOS Quad 2-input NAND Sch. Trigger	40c
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45208 CMOS Dual Binary Counter	50c
45558 CMOS Dual 1 of 4 demultiplexer	40c
401068 CMOS Hex Inverting Schmitt Trigger	50c

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- Crystals, 3.6854, 4.3008, 4.7827, at 50c each
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New Zealand

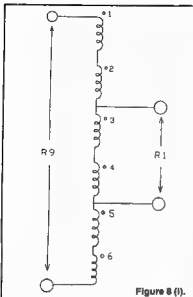


Figure 8 (i).

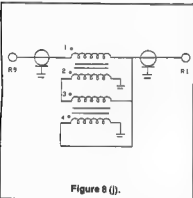


Figure 8 (j).

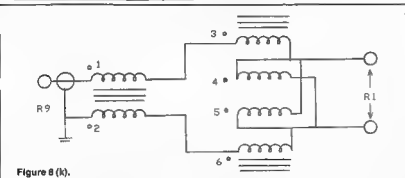


Figure 8 (k).

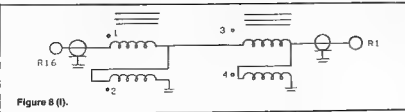


Figure 8 (l).

10. CONCLUSION

I would like to thank two colleagues for their roles in my compilation of these articles — Pat Lawler VK3DCN, for the initial discussions which occasioned the series, and John Day VK3ZJF, for making the entire Amidon ferrite and powdered iron core range of Stewart Electronics available to me. This range covers from DC to 1000 MHz, from 1 milliwatt to 10 000 watts. Needless to say, this proved more than adequate for my purpose.

There is a far greater amount of theory and practical detail associated with the subjects of RF transformers and ferrite cores. Parts one through four were designed to give a basic insight and a practical introduction to those with limited, or no background on the subjects

REFERENCES

- PITZALIS & COUSE: Broadband Transformer Design for Transistor Power Amplifiers. *Ham Radio* magazine.
- ARRL Handbook.
- Electronics Today International magazine.

REPRINTING THE RD LOG AT A LATER STAGE

Terry Neumann VK5ATN
PO Box 200, Balaklava, SA. 5461

After the adaption of Dion Thomas' C64 RD Log Program for my TRS 80 Model IV, it became apparent that it was not possible to reprint the log in the form required by the Federal Contest Manager (FCM), other than during the contest itself. This is because the file as saved to disc contains only a 'condensed' version of each contact (saved as a string in a sequential file), and does not include date, or full cipher exchange as such. When the disc file is reloaded into the RDLOG program, the printout option allows only a short form printout similar to that shown in the 'last contact' part of the main operating menu.

DISASTER IN THE CONTEST

The 1987 contest was not one of my best. I elected to retire from the fray on the Saturday evening due to a "Force Majeure" at about 10.30 local time, so any possibility of a high score was dashed. However, a return was possible later on the Sunday and some 440 plus contacts were to result from the encounter which again reaffirmed its reputation as the 'friendly contest'. The good humour and professional approach of almost 100 percent of operators encountered indicates that the spirit and purpose of the contest is alive and well!

During the course of the contest I became aware of several mistakes in entering data, mostly wrong call signs which were picked up later in the event. A major blunder also occurred when a careless operating error coupled with a fool-prone routine in the version of the program in use, resulted in two stations being given the same number. It was clear that I could not claim a point for the second of these contacts. The possibilities of this recurring were eliminated by a change to the program. However, since these mistakes were all faithfully recorded on disc, it became obvious that some means of correction and re-printing of the log would be necessary. Otherwise the final result would again resemble a untidy shambles, which no self-respecting contest manager should be expected to tolerate.

GETTING THE RECORD STRAIGHT

Corrections to the data saved on disc were easily effected using the LDOS utility FED (File Editor), an excellent utility which enables the alteration and editing of disc files. Although FED is only available on the Model III versions of LDOS, the disc files of the Model IV are fully compatible and can be edited in the Model III mode. Needless to say, such corrections must be done on a backup of the original disc file, to guard against any disasters.

Accordingly, details entered incorrectly during the contest, as noted on the correction sheet, were again put right. Things started to look a little brighter; all I had to do now was find a way of getting it all down on paper again!

THE SECOND PROGRAM

Rather than modify the RDLOG program to reprint the log at the expense of still more memory space, it seemed more reasonable to write another dedicated program to do the task. The now much modified version of VK2PD's original program was used as a basis for a new program to recover and expand the corrected disc file and print it in the required format. As this progressed, routines were written into the program to automatically total and print the score for each page. The problem of an invalid contact which should score zero points was solved by again using the FED utility to add an X on the disc file at the end of the number received for that particular contact. The program tests for the presence of this X when re-expanding each contact, and if present, scores zero for that contact.

A further subroutine was written to check for the new UTC date which occurs during the contest by performing a test on the time of each contact. When the first contact for the next UTC day is detected, the printing is interrupted and the option to enter the new date is offered. A warning is displayed on the main menu to this effect, to enable starting date to be reset prior to the next test printout.

Finally, the option of 'printing' out the final result, either to screen or paper is available from the menu. This allows the testing of the final result before committing it to paper. The page length can be altered to suit your own needs but for convenience, the hard copy option is set for 50 contacts per page. Some editing in the program will be needed if you need to change this. The 'screen page' can be set at any length from the Main Menu.

In practice, I found that the program would enable me to print the entire log in the required form with each page scored, without any need to put pen to paper, except for the signature on the front cover, other details of which were done by word processor.

The main operating menu is shown in Figure 2. Most of the functions are similar to the original RDLOG program, or have been changed where necessary to more usefully reflect the requirements for re-printing the log. Both this and the RDLOG program need editing in a couple of places to change the call sign to that of the user. These are noted in REM statements at the start of the listing. When all REM statements are removed, there is just enough space in the LOGPR program to handle the maximum number that can be accumulated with the original RDLOG Program (about 850 contacts).

VERSIONS FOR THE TRS 80 MODEL III

Finally, and primarily as an exercise in programming, I spent some time adapting both programs for the TRS 80 Model III. These versions have not been tested extensively, but appear to be capable of performing all of the main features of the Model IV version, albeit at slower speed. These are offered to Model III LDOS owners who might be interested as such, but a test run is strongly suggested prior to the contest itself, and some further de-bugging may be needed. Indeed such a run is a good idea with any such program, because you, the operator will become more familiar with the operation of the program.

LOG REPRINT PROGRAM - - - Version 4.04 - 7096 Bytes free

=====

443 Contacts loaded into in memory ! Force Trash Collection - < Shift F3 >

TO CHANGE: - Page Length - < F1 > Date - < F2 >

Display log - < Shift F1 > Print log - < Shift F2 >

Recall Disk Files - < ! > Force Last Page Total - < \$ >

=====

Date is presently set for : 16/08/87 Page length is 50 entries

Select Functions:

TOPICAL TECHNICALITIES

Lindsay Lawless VK3ANJ
PO Box 112, Lakes Entrance, Vic. 3909

In addition you may also find any remaining bugs which have eluded my own laborious efforts. Use a copy of last year's log for at least a couple of hundred contacts or so as a test for both yourself and the programs.

Owners of the TRS 80 Models IV or III, or indeed anyone who is interested is welcome to listings or disc copies of either or both programs. Additional notes on the operation of both programs are included. Inclusion of return postage is essential and a formatted blank 5 1/4 inch diskette with suitable packing for a safe return (again with appropriate return postage included) is required for disc copies. Please remember to state which Model TRS 80 you have. It is assumed that you have the required DOS (either LDOS 5.1.4, 5.3 or TRSDOS 6.3 or LS-DOS 6.3) for your machine. Modern transfers at 300 Baud are available via Telecom at the recipient's expense and risk.

In conclusion, I have found the programs, once up and running, to be an invaluable asset to entering the HF section of the RD Contest, and getting that all important log in to the FCM. I would like to congratulate and thank Dion Thomas for submitting his original article and listing in July 1987 AR, which provided both the stimulus and working basis for the subsequent results

Trap dipoles are useful aeriels capable of operation on several bands without a coupling unit. They are usually constructed from a proven design using specified components and element lengths. It is easy to design a system to suit available components or desired element lengths.

Figure 1 illustrates the simplest version — the centre section, 2B in length, is a halfwave at a frequency f_1 . The traps isolate this section from the remainder of the aerial when operating at f_1 . At a lower frequency, $f_2 = f_1/N$ the traps are loading reactances (X_L) to resonate the total aerial of length A to f_2 . Simple manipulation of basic parallel circuit theory reveals:

$$X_L = N^2 w C (N^2 - 1) \dots (1)$$

$$C = N^2 w X_L (N^2 - 1) \dots (2)$$

$$L = 1/w^2 C \dots (3)$$

$$\text{where } w = 2\pi f$$

Those three expressions enable a choice of L, C or X_L and calculation of the others.

EXAMPLE 1

- Choose a length A greater than a halfwave at f_1 .
- From the charts, for off-centre loaded dipoles in the ARRL Antenna Book determine the reactance necessary to suit A and B — this is X_L .
- Calculate C from (1).
- Calculate L from (3).

EXAMPLE 2

- Choose L and C from the spares box.
- Calculate X_L using (1), (2) and (3).

- From the chart in the antenna book determine the length to match X_L .

The total aerial need not be symmetrical and the traps need not be identical but chosen to suit the available components.

N = 2 is the simplest design example and the following is the result for an aerial for use on 3.5 and 7 MHz

$$C = 68 \text{ pF}$$

$$L = 76 \text{ uH}$$

$$X_L = 223 \text{ ohms}$$

From the antenna book chart, at the intersection of approximately 220 ohms and B = 50 percent, A is approximately 85 percent. 85 percent of a halfwave at 3.5 MHz is approximately 35 metres. B is a quarterwave at 7 MHz about 10.2 metres.

Those dimensions are close to those found experimentally.

For readers interested in some experimental maths, a set of simultaneous equations will reveal the possibility of operation of that aerial on 14 MHz and the low end of the 28 MHz band.

The formula, from which the ARRL charts were derived, can be found in CQ magazine of December 1981, together with a solution program in BASIC.

It is not possible to design for any value of N and the above information can be used to determine the possibilities and impossibilities. Try and design for 24 and 18 MHz — that is one of the impossibilities!

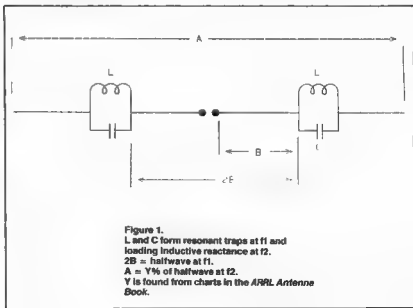


Figure 1.
L and C form resonant traps at f_1 and loading inductive reactance at f_2 .
2B = halfwave at f_1 .
A = $Y \times$ halfwave at f_2 .
Y is found from charts in the ARRL Antenna Book.

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THREE WEEKS IN AUGUST

Meg Box VKSAOV

56 Clifton Street, Hawthorn, SA. 5082



The unaccustomed sound of static crackling through the library and the unfailing attraction of the voice of the operator exchanging comments with amateurs in far places drew the girls into the shack . . . for three weeks in August students of Walford Anglican School for Girls (years 1 to 12) in South Australia had an amateur radio station operating from their Senior Library.

Bryan VK5NOS with (from left) Emily Strickland, Rhonda Summers and Sarah Schluter at the microphone.



Meg VKSAOV, checking the equipment.



Erecting the TH3 — Members of the Adelaide Hills Amateur Radio Society (from left) (up) David VK5OV, (down) Graham VK5KGS, Bill VK5KWM, Alan VK5ZD, Ron VK5RV, Bryan VK5NOS and Hans VK5YX.



Walford students (from left) Sally Veitch, Emily Steele, Diana Williams, Clare Patience and Alex Long with the radio station that was set up at the school.

—Photograph courtesy Messenger Press

Geography, great circle routes, long and short path, communication, courtesy, friendship, co-operation, and the excitement of making new friends appealed to them all.

"Can we talk to Carlo in Turin today?", "may we ask the boys for their telephone numbers?", "will that King be talking today?" were examples of the interest generated.

Thanks must also go to the Librarian who, at the conclusion of the three weeks was heard to say that she hadn't been sure that she would be able to cope with the presence of the radio but apart from one day when there were many students moving through her group in the library she enjoyed it all and found it most interesting.

There is a record of a repeat performance for Walford's Centenary in 1993, so look for us again then! And, in any case, it is a worthwhile experiment which others may like to try, and who knows how many new amateurs we may bring to our hobby in the future?

Walford students have had an experience they will remember for a long time.

On behalf of the school I wish to thank all of our operators, and all who worked AX5WI or VIBBSA. We would welcome your QSL cards as a record for the school — our cards are on the way to you. Please QSL to PO Box 430, Onley, SA. 5061



Denise VK5YL with a student and her mother.

LIST OF OPERATORS

Some worked in pairs and trios, whereas others were solo.

Alan VK5ZD Jenny VK5ANW Christine VK5KTY
Bryan VK5NOS Denise VK5YL Bill VK5KWM
Joy VK5YJ Doug VK5KDH Frank VK5AZS
Maria VK5BMT Geoff VK5TY Myrna VK5YW
Meg VK5AOV

Why doesn't your company advertise in *Amateur Radio*?

The operation was mounted as part of the school's Bicentennial celebrations and was facilitated by the encouragement of the South Australian Division of the Wireless Institute of Australia, the Adelaide H. Is Amateur Radio Society whose members supplied and erected a TH3 Jr, and the generosity of the many amateurs who gave their time to run the station between 0300 and 0700 UTC each school day (There are two amateurs on the staff of the school, Denise VK5YL and Meg VK5AOV, and Christine VK5KTY, is a former member of staff).

Antenna-raising was the order of the day on Sunday, August 7, and in record time both the TH3 and VK5NN's trapped dipole were safely established in position. Then, courtesy of the AHARS members, out came charts, maps, DX lists, UTC clock, a J-pole, an azimuthal map and all the extras that went to make a study room become a shack.

Because Walford is a girls' school, I was keen to have as many YLs as possible as operators and we managed to have YLs operating on 10 of the 15 days, all of them members of ALARA.

About 60 of the students are boarders, some of whom have been involved with radio communications as part of their property management or through the School of the Air. Here was a different experience for them, and an opportunity for them to excel when it came time to take the microphone.

One of the highlights of the operation was the "Schools Across Australia, Amateur Radio Communications" link where the girls made contact with boys from Wesley College in West Australia, via Trevor VK6ATR, students from St George's College, South Australia, courtesy Alan VK5TP, and students from Maryrystville Primary School in South Australia through Graham AX5AQZ, the co-ordinator of the link across Australia (If you would like to hear students comparing notes why not listen in around 0430 to 0530 UTC on 21 80 MHz on Fridays).

The signals on 15 metres improved as the afternoons wore on and many friendly amateurs chatted with the students from their QTHs in Italy, Seattle, Chicago, New Zealand, South Africa, Bogor, Russia, London, etc, as well as

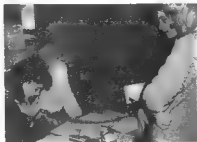
from Townsville, mobile on the way from Perth to Meekatharra, portable from Windy Point overlooking Adelaide (simplex two metres) and so on.

One group heard the Travellers' Net and had the operation explained to them. Another learned about WICEN, whilst all were encouraged to find the originating stations on the world or Australian map and place a pin to record the location of each contact.

Students were given a copy of the phonetic alphabet and a standard format to prepare comments for their QSOs. In this way they were able to spell out their names in phonetics and be assured of having something to say when their turn came to take the microphone in their shaking hand. The shaking came more from the excitement of the experience rather than from shyness and the girls received many complimentary comments about the clear diction and pleasant presentation.

The use of phonetics also showed the girls that, even when a name which is uncommon in one country is spelled out, then others will understand and be able to reply using the correct name. For example, the name Ruth was not familiar to one of the Italian contacts until phonetics were used.

Another group had been preparing by learning to send their names in CW, and thanks go to the patient operator who heard them all send their names to him.



Jenny VK5ANW, with some of the girls.

MOUNT SKENE REVISITED

William Magnusson VK3JT

359 Williamstown Road, Yarraville, Vic 3013

"It's been far too long," someone said. I agreed. It had been three or four years since we had mounted a full scale Mount Skene DXpedition. The rumblings were there however, people were getting restless. Peter VK3AVE and Caroline signed on instantly. Dick VK3ARR and Eileen replied "When do we start?" Graeme VK3NE, was working with the Australian Antarctic Research Expedition as VKONE, on Macquarie Island. His reply was tersest post haste "Don't go without me. I'll be back in November." Huntly VK3ZE, was champing-at-the-bit. George VK3LA, began organising a leave pass for a week, and Phil VK3AWG, started to brush the cobwebs out of the amateur television equipment.

I thought to myself, "This is crazy, they have forgotten about the ants, the March flies, the freezing cold nights, the inevitable two or three days of wild weather" but then I too remembered the sheer magic of the place. A mile high in the alps. The clear, crisp mornings with a million drops of dew reflecting the sun's rays. The mist rising slowly out of a hundred valleys. The bird songs. The unbelievable sunsets. The blacker than black night sky with stars blazing. The brilliant wildflower display.

Was it any wonder we had made this place a must for so many years in our amateur radio calendar? I remember 'discovering' Mount Skene on a trip during one of the old VHF/UHF field days of many years ago and musing then on the possibility of a full scale DXpedition some day. I had been a regular visitor for some years when one night Dick and I were working late in his laboratory at school. I think he was building an ATV transmitter. He was looking for a site to try ATV from a portable location not too close to Melbourne. Of course Mount Skene sprang to mind and the first of many expeditions was born. It was highly successful. We worked ATV to Sylvester VK3ZSD, in Geelong. Good quality colour pictures over 200 kilometres (120 miles) on five watts of power using a 48 element phased array on 428 MHz. We worked through OSCAR 6/7/8. We even made it on to the front cover of *Amateur Radio* magazine and it whetted everyone's appetite for more. It became a regular event for a dozen or so amateurs, their family and friends. From time to time Dick and I (we were both teaching then) would take students on a technology camp to "the hill" to share our experiences. The little group grew until we had people with interests in HF, VHF, UHF, ATV, satellite communications and packet. Stephen VK3YMY, even brought up an astronomical telescope one year. The location proved to be perfect for astronomy. Altitude 1600 metres (5200 feet) no large settlements for 80 kilometres (50 miles) and black skies at night. We built a rigid mounting base out of local rock, rugged up and had a wonderful time peering deep into the southern night sky.

While Dick went overseas for a few years and I made preparations for an eventual move to Eden, New South Wales, the Mount Skene trips were put 'on hold'. That was in 1983, the year

that OSCAR-10 was launched. It worried me that we now had the best opportunity ever for DX by satellite but were not in the position to mount a full-scale expedition.

I was keeping in touch with Dick by mail. He was studying at the University of Dayton, Ohio. In one of his letters he said that he was in a position to work OSCAR-10 from the station of our mutual friend, Paul WH8SJ. It was around Christmas time so we organised a sched for New Year's Day on Mount Skene. George and I held a full dress rehearsal in the fields at the back of his QTH and all was ready. Huntly and I made the trip up the mountain a few days before sched time and set up the equipment. It all worked perfectly and we made many contacts into the USA. At the appointed time we watched the 'window' extend slowly across the States. We worked into W6, W5, W7 and finally W8 areas but there was no sign of Dick and Paul.

We called out heads off over a four day period only to get back down to Huntly's place to find a telephone message from Dick to say that they had been hearing us all along but had a series of equipment failures that had prevented them replying to us.

Now, three or four years have passed and it would seem the troops are ready and we are off and running again. Timing is, as always, the problem between Christmas and the first week in January. There will be a dozen or so in the party. Equipment will cover all HF and VHF/UHF bands. We will be taking plenty of equipment — computers, transceivers, power supplies, decoders, modems, masts and antennas. Yagis, Yagis, a long wire, quads, loop Yagis, circularly polarised arrays for use with the satellites — we may even rebuild the phased array for 428 MHz. Power will be via a portable petrol generator with battery back-up.

We now have a new satellite, OSCAR-13. Huntly, Graeme and I will be concentrating on working that, and Fuji or RS-10. Peter will, no doubt, bring his packet setup and digipeater set into Gippsland, Tasmania, and New South Wales. Dick, George and Philip will operate on 428 MHz, and try to better their contacts with Sylvester in Geelong. We will probably run out of time, we always have in the past. Look out for us signing 'portable Mount Skene' Times and frequencies are as follows.

3.570 MHz SSB	2030 UTC
7.090 MHz SSB	0630 UTC
14.150 MHz SSB	0603 - 0730 UTC
147.800 MHz FM	1000 UTC
AO-10 & AO-13	145.907 MHz
Mode B	downlink
428 MHz ATV at all hours	Liaison on 147.400 MHz FM
2m packet	usual packet frequencies
all hours	

Remember however all the above activities will be interspersed with important things like walking, bird-watching, photography, cooking, eating, socialising, and generally sitting in the sun.

Given a day or so to set everything up we should be ready for operation on December 27, and we plan to stay until the end of the first week in January 1989. Depending on the weather, of course, as it has been known to snow up there even in January!

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Miniaturisation Brings Change

Electronic components have been shrinking in size ever since the first wireless sets were built and means of connecting them have had to change to accommodate this miniaturisation. Soldering continues to be the method used but the actual soldering techniques have changed radically while the metallurgy of the solder used has not.

Typically an alloy of 40 percent lead and 60 percent tin is used. This is called a "eutectic," the mixture of the two metals with a lower melting point than either of the metals alone. The popularity of this type of solder is its low melting point, the ready availability of the metals and their relative cheapness.

In the days of valves, electronic circuits were assembled by point-to-point wiring. This meant components such as resistors had to have axial leads for soldering. The point-to-point wiring method is essentially simple but requires a lot of labour. Even so, it is still used today for some high power electronic circuitry.

The next step in the evolution of electronic components was the introduction of the printed circuit board which had the circuitry incorporated. This occurred at the same time as the first transistor radios appeared but printed boards were also used extensively for valve circuits such as television sets in the late 50s and early 60s.

With printed boards, the electronic components no longer had to be individually handled and soldered into place. Components could now be assembled onto the boards by machine and soldered by a continuous process in a wave solder bath where the solder is made to flow so a peak of solder comes briefly in contact with the component and solidifies as the component moves on. This led to more reliable circuits as solder joints became more reproducible and consistent.

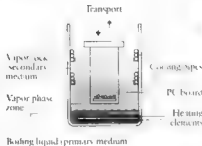
With the wider use of transistors, circuit voltages were lower and components could become much smaller. Finally, as integrated circuits were introduced, component size was reduced even further.

Because of this miniaturisation a system of attaching components called "surface mounting" was developed. With conventional technology components were secured by soldering leads on the underneath of a printed circuit board after passing them through a hole. This was called the "through hole system". The increasing numbers of components meant boards would have to become too large if through hole technology was used. Also, as transmission speeds increased, processing of information was slowed down if components were too far apart. Finally drilling holes through the printed circuit board increased the cost. To cope with these new requirements the components were attached directly to the board and soldered on top if it or surface mounted.

Because of the generally higher costs of surface mounting such a system has been adopted only recently. Two areas of difficulty were the need for new techniques in soldering and the possibility of fractured components and solder connections due to different rates of expansion on heating of the components and circuit boards during soldering and service.

Now these problems have been solved, surface mounted components are rapidly spreading

The Principle of Vapour Phase Soldering.

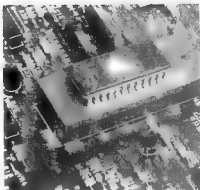


to all branches of electronics and, particularly in Japan, to consumer electronics.

While many surface mounted components can be soldered in several ways, progressively new automated soldering techniques have been developed. Wave soldering is the most popular automated soldering process in the production of printed circuit board assemblies. The solder bath temperature is between 240 and 260 degrees Centigrade and contact between the solder and the component is one to three seconds.

Dual wave soldering is best for surface mounting. With the first wave a jet of solder is sent up to ensure good wetting of all metal parts while a second wave removes the excess solder.

The latest type of soldering used with surface mounting is a vapour phase reflow technique. A form of solder paste is applied to the printed circuit board which is then uniformly heated in a container of vapourised inert gas. The gas is trapped in the container by a cooler gas above it.



As the board is withdrawn from the inert gas the solder solidifies and holds the components in place. Vapour phase soldering is thus a very gentle method of soldering that stops overheating and minimises heat damage to sensitive components.

With the solving of technical difficulties including soldering technique, it is estimated that surface mounted components will take 70 percent of the total component market by 1990. Their success lies not only in the miniaturisation of assembly techniques and the increased reliability of components. Such components are also lighter than conventional ones making them ideal for mobile appliances while the elimination of the need for leads makes them highly resistant to shock and vibration.

—Diagram courtesy of Siemens Ltd. Article reprinted from Elements July 1988, the quarterly magazine of the Australian Lead and Zinc Development Associations (ALZDA).

SUBSCRIPTION REMINDER NOTICES

As from now, only one membership subscription notice will be forwarded to members each year.

A reminder notice will not be sent!

As from now, only one additional issue of *Amateur Radio* magazine will be sent to you if your renewal subscription is not received.

Not two additional issues as in the past!

Only a small number of *Amateur Radio* magazines are now being printed each month surplus to members requirements. This means that if you do not renew your subscription on time, you may not be able to get your missing copies of AR!

WHEN YOUR MEMBERSHIP RENEWAL IS DUE, PLEASE PAY PROMPTLY AND ENSURE CONTINUAL RECEIPT OF AMATEUR RADIO MAGAZINE!

GIFT HONOURS WAR CASUALTIES

Former RAAF Wireless Operator and Air Gunner, Maurie O'Keefe VK3KQ, can rest a little easy these days after successfully completing a five-year mission to restore radio equipment for the Australian War Memorial.

Maurie 63, was an operator in the RAAF Squadron 480 which flew Lancaster bombers in World War II.

"The reason I took this job was to show future visitors to the Australian War Memorial some visible signs of the equipment we used," he said.

His restoration of wireless sets for the War Memorial are a personal memorial to the heavy casualties suffered by the squadron. A total of 978 crew members were killed during the war.

Maurie began his mission after seeing the famous G-for-George Lancaster bomber exhibit at the Memorial, in Canberra, and regretting it did not have radio equipment.

The T1154 transmitter and R1155 receiver were used in the bombers. An earlier story in *Amateur Radio* magazine reported the restorations of a transmitter and receiver.

These sets are now on a navigator's table beside the G-for-George exhibit. Maurie proudly handed over a second transmitter and receiver combination for installation inside the bomber on October 12, 1988.



Maurie O'Keefe with three women who helped staff radio stations in World War II — Shirley Schaeche, Joan St John and Nancy Wright.

—Photograph courtesy Leader Associated Newspapers Pty Ltd



Maurie demonstrates the transmitter to another ex-serviceman.



Maurie with the radio and transmitter he restored for the bomber.

Photograph courtesy Darryl Gregory of The Canberra Times

STUDENTS TODAY — SPACE ENGINEERS TOMORROW

Australia's embryonic space industry will depend heavily on today's school students.

Paul Butler VK3DBF
HEAD OF SCIENCE AND COMPUTING
Mentone Girls' Grammar School
 11 Mentone Parade Mentone, Vic 3194

It is important to capture their interest in space now, in the hope that some of them will become involved in space technology.

The Satellites in Schools Project, an initiative funded as part of the Bicentenary, has been established to help teachers get started with satellite technology in the classroom. The project will eventually involve teachers and students from all parts of Australia.

The program will be based initially on studies conducted over the past few years into ways in which satellite technology can be incorporated into a school's curriculum. Schools have shown that satellite technology, including amateur radio satellites, can be used in physics and general science at upper primary and secondary level. A study of satellite orbits and of data coding and decoding can be included in other subject including geography, mathematics and information technology.

Students from Grade 6 upwards at Mentone Girls' Grammar School are learning about satellites in physics and electronics lessons. They receive signals directly from satellites and record them using an ordinary cassette recorder. The audio tones are then decoded electronically and displayed on a computer terminal.

Best results so far have been from two educational and scientific satellites built by the University of Surrey, in Guildford, UK, and operating on the amateur bands. Called UoSAT 1 and UoSAT 2, they transmit several kinds of data, including telemetry and whole-orbit data.

Measurements of internal and external temperatures, solar cell currents, battery voltages, satellite spin rates and other quantities are continually made and transmitted to Earth directly as telemetry or stored over several orbits and sent as a complete block of data.

Students can plot graphs of whole-orbit data and then use their graphs to study the physics of the satellite and its environment. The spin and orbital periods can be deduced from the graphs, while the nature of the Earth's magnetic field and the charged particle activity in near space can be studied.

The possibility of two-way satellite communication is being investigated as part of the project. Direct communication is possible through AMSAT satellites, as well as indirect messaging using the digital communications experiment (DCE) aboard UoSAT 2. Schools in Australia can send messages to the UK, for example, using amateur radio stations to access the DCE digital store-and-forward facility.

The Satellites in Schools Project will enable lessons learned in schools already using satellites to be shared with other schools. More than 60 schools have expressed interest in being involved with the project, including Footscray Technical School, where teachers Bill Magnusson VK3JYT and John Seddon, are using amateur satellites in classroom experiments.

Their students have built antennas to receive signals from the UoSAT satellites and are involved in a program of experiments. John Seddon said that electronics drew heavily on other disciplines such as physics and mathematics. There would be few better ways of demonstrating the relevance of these subjects than a satellite communications project, he said.

In 1986, the Footscray Technical School students and others around the world followed the progress of the joint Canadian-Russian Shtrek across the North Polar ice-cap. The skiers, four Canadians and seven Russians,

trekked 1730 kilometres from the northern-most point of Russia to northern Canada, navigating using search-and-rescue satellites. UoSAT 2 with its digital speech synthesiser, enabled skiers to hear their location read to them as the satellite passed overhead.

To increase space education activities in Australian schools, a start will be made soon on the development of classroom resources and teacher training materials. Satellite hardware and software purchased using a Technology Education grant from the Victorian Government will be available for loan by participating schools.

This project is only a beginning. More studies are needed to assess the value in the classroom of a range of satellites, including weather communication and surface-imaging satellites. Teachers and students interested in being part of the Satellites in Schools Project should contact the author of this article.

MORSEWORD

22

Audrey Ryan
 30 Starling Street, Montmorency, Vic. 3094

ACROSS

1. Wound
2. Joint
3. Short holiday
4. Errors
5. Those people
6. Poems
7. A peer
8. Sporting ground
9. A present
10. Reduces the light

DOWN

1. Expectation
2. Eat and drink
3. Stitches
4. Gentle
5. Skin
6. Intertwine
7. Conversation
8. Enjoy
9. Desserts
10. Cooking term

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1										
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Contests



CONTEST CALENDAR

DECEMBER 1988

- 3 — 4 ARRL 160 Metre Contest (Unconfirmed Date)
- 10 — 11 NZART, VHF/UHF Field Day Contest
- 10 — 11 ARRL 10 Metre Contest
- 24 — Commencement of the WIA Ross Hull Memorial VHF/UHF Contest (Rules November AR)

January 1989

- 7 — Conclusion of the WIA Ross Hull Memorial VHF/UHF Contest (Rules November AR)
- 28 — 29 VHF/UHF National Field Day Contest (Rules this issue)

MARCH 1989

- 11 — 12 RSGB Commonwealth Contest
- 18 — 19 NZART Field Day Contest
- 18 — 19 WIA John Moyle Memorial Field Day Contest

FIELD DAY

A VHF/UHF Field Day Contest is to be held in New Zealand on December 10-11, Saturday from 1700 NZDT to 2300 NZDT, and Sunday 0700 to 1300 NZDT 12 x 1 hour periods.

All bands, modes and techniques apply.

Full details of this, and the general rules for ZL VHF Contest appeared in *Break In*, December 1987 (information from ZL1AAS). Thanks John.

The rules for the ARRL 160 metre contest appeared in December 1987 AR.

The information regarding the rules for the 1988/89 Ross Hull Memorial Contest have been passed to the NZART for publication and more interest should be apparent from ZL now that the winners certificates are saved to cover the various locator "F" aids and now call areas or countries.

The number of logs received for the 1986 and 1987 contests remained static, let us see if we can get more logs into the results this year.

Whilst attempting to answer a query from a contestor who was somewhat confused about the system of call sign allocation used in New Zealand I received some information that could explain to a certain degree why such confusion can exist for DX stations in ZL, novice stations have the N suffix, ie ZL1NAA, but as at present, if a VHF limited station passes in the novice Morse test, he is then allowed novice privileges, but still retains the T or U suffix as used by limited license holders, ie ZL1UFO holds a Novice Licence.

Amateur radio, or the "Amateur Service" as it is known throughout the world, always includes in the definition "self training in radio communications" amongst the other portions described.

This self training is meant to improve the amateurs ability to transmit and receive with 100 percent accuracy a message, be it in plain language or some form of code. Over a great number of years the use of contests have been to the fore in putting this ideal into practice under various operating conditions.

The vast majority of contest logs received show no errors at all and reflects the care and required attention to detail of the operators involved in the passing of messages with a 100 percent accuracy. This is what a contest is about. Accuracy and speed of message passing, plus the skill in using the propagation to your advantage. Operators who have had an entry disadvantage in a contest because of errors in excess of those allowed for in the rules should not feel they are being penalised too much, but should participate in more contests

to improve and build up their technique. Remember, even the world's best contest operators make mistakes, and contesting can still be fun if in doubt ask for a repeat report.

For the VHF/UHF operators who have been asking for the VHF/UHF portable contest, January will be the month for it. In response to all of you who have written to me regarding the lack of a national field day type contest, I have compiled a set of rules that should accommodate your requests. I have deliberately kept the rules simple (to make my life easier) and am using the Maidenhead locator square system as in the Ross Hull Memorial Contest. The scoring is biased towards the portable stations. Much thought was put into the date and time period, and the placing of the contest is between the Ross Hull and John Moyle contests when the weather is still summery and a good proportion of the contesters will be on holiday. The times chosen will give most of you time to set up the station at your favourite spot and get home again before nightfall. Good luck to you all. Please try and participate so we can see what the prospects for a 1990 repeat are like.

May I take the opportunity of wishing you all the compliments of the season and a prosperous New Year.

73, Frank Beech VK7BC

RULES FOR A NATIONAL VHF/UHF FIELD DAY CONTEST 1989

OBJECTS: To promote the portable operation of amateur stations using VHF/UHF amateur bands, modes and techniques. Overseas stations are invited to participate.

PERIOD: January 26 to January 29, 1989 From 0200 UTC Saturday until 0159 UTC, Sunday.

SECTIONS

Section A — any continuous 12 hour period.

Section B — any 24 hours operation.

CATEGORIES

(a) Single operator, Single band — one person performs all station functions

(b) Single operator, All band — one person performs all station function

(c) Multi-operator — those stations using more than one person for operators, loggers, spotters, etc.

(d) Home station, All band — one person performs all station functions.

CONTEST EXCHANGE: Contest exchange is: Signal Report RS/T, Serial Number commencing at 001, Maidenhead Locator Square Number to four figure, ie QF38.

SCORING

Two points per QSO on 50 and 144 MHz

Four points per QSO on 432 MHz

Six points per QSO on 1296 MHz

QSOs between portable field day stations count for double points.

Home stations, half score; ie 1 point on 50 and 144 MHz, 2 for 432 and 3 for 1296 MHz.

MULTIPLIERS: The total number of different Grid Squares on each band, ie each different grid square counts as one multiplier on each band it is worked.

FINAL SCORE: Multiply the total number of QSO points by the total number of multipliers.

REPEATERS: The use of terrestrial repeaters is not allowed for scoring purposes.

REPEAT CONTACTS: To generate activity, repeat contacts are allowed after a period of four hours on each band.

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelus Drive, Legana, Tas 7277

LOCATION: A station must remain at one location, ie cannot change the locator grid number by being stationed on a grid square boundary.

POWER SUPPLIES: For Portable Field Day Stations — the use of ma ba bourne power is not allowed.

SCORING EXAMPLE

BAND	QSOs	QSO POINTS	GRID SQUARES
50	25 x 2	50	10
144	70 x 2	140	17
432	12 x 4	48	4
1296	3 x 6	18	2
TOTAL	111	256	33

Final Score = (QSO points) x (Total number of grid squares) 256 x 33 = 7514 points.

AWARDS: Highest scorer in each section of each Maidenhead Locator Field.

Highest scoring club station.

ENTRIES: Post your entries to the Federal Contest Manager, C F Beech VK7BC, 37 Nobelus Drive, Legana, Tas, 7277. Entries must be postmarked no later than February 28, 1989.

FRONT SHEET: This must include a signed statement that the rules and spirit of the contest have been respected.

The claimed score must be set out as in the example shown.

DISQUALIFICATION: The contest disqualification criteria, as laid down from time to time in *Amateur Radio* will apply to this contest.

WILL YOU HELP?

As you no doubt know by now, the WIA has established a QSL collection. Something had to be done to save both old and present day QSL cards for the future. These then may be used by historians and others to record the history of amateur radio and can be used for exhibition.

We all know the fate of most QSLs, but some can be saved.

If you can help or perhaps know of a widow or or other close relative of a Silent Key who may wish to donate QSLs to the collection, please contact me if you hear of any amateur shifting QTH and having a clean out of the shack, please pass on the message.

We need any kind of QSL, and appreciate donations of any number of cards. Old timers of all States of Australia have been generous but we need many more QSLs — also QSLs of present DX operators (we are very light on here).

Please contact, PO Box 1, Saville, the Honorary Curator, Ken Malchett VK3TL Vic, 3139, or telephone (059) 64 3721, if you think you can help.

Ken will make arrangements for the pick up of the cards.

Will you help? It is a worthwhile cause.

—Contributed by the Honorary Curator, Ken Malchett VK3TL

KNOW YOUR SECONDHAND EQUIPMENT

Ron Fisher VK3OM

7 Fairview Avenue Glen Waverley, Vic 3150

Last month we looked at the last of the valve-transistor transceivers from Yaesu. This time we will discuss the first of the full solid-state HF transceivers. I have always had a feeling that some of the early Yaesu solid-state final units were not as popular as they should have been. I will give my impressions of why this might have been as we go along.

YAESU FT-301 TRANSCEIVER SERIES

These were compact, solid-state transceivers designed to operate from a 13.8 volt DC source. There were three in the series — the 301S with about 10 watts output, the 301 with 100 watts output and the 301D, 100 watts output and a digital frequency display built in.



Personal feeling is that Yaesu made a bad mistake with the physical design of the 301 transceivers. The all-black colour scheme was not all that popular and the S-meter was too small. But, if you can tolerate this they offered adequate performance on all of the pre-WARC bands from 160 to 10 metres.

The transceivers were released in early 1976 at the following prices: 301S was \$789, the 301 \$1075 and the 301D was \$1269. These prices did not include the optional DC power supplies.

A review of the 301D appeared in the December 1976 issue of *Amateur Radio* and I made the following comments on frequency stability: "VFO stability was checked and found to easily meet the specified 100 Hz per half hour. Drift over the first half-hour was almost exactly 100 Hz and over the next half-hour did not exceed 150 Hz. However, over the same period of time, the digital readout drifted 800 Hz. An interesting case where the VFO was more stable than the frequency counter."

Apart from the power output, the S-model did not have the notch filter but did include the RF speech processor common to the other models.

Secondhand value for the three models would be: FT-301S about \$350, FT-301 about \$525 and the FT-301D about \$575.

YAESU FT-7

Without doubt, the most famous of them all! Introduced in mid-1978 at a price of \$539, the FT-7 was not immediately popular. But in early 1979 the price dropped to around \$370 and everyone wanted to own one. Now, if you happen to be one of the few who has not come across the FT-7, let me describe it to you.

The FT-7 is a fully solid-state HF, SSB/CW transceiver that covers the pre-WARC amateur bands from 80 to 10 metres. It covers a total of 500 kHz on each band including 10 metres

where the standard coverage is 28.500 to 29.000 MHz. As there is only one band switch position for 10, any additional coverage here requires a slight modification. Power output on both CW and SSB is around 15 watts with some exponents of FT-7 modifications claiming up to about 30 watts. Whatever, because of the excellent transmitted audio, the 15 watts goes much further than may be imagined. Perhaps one of the best liked features of the FT-7 is the simplicity of operation — set the band-switch, tune to the required frequency and talk! A receive-only clarifier, noise blanker and crystal calibrator are the only concessions to the bells and whistles brigade. Receiver sensitivity is excellent and the smooth dial drive makes tuning a pleasure. For home station use a DC power supply is required which delivers 13.8 volts at about four amps.

Secondhand value today would vary from about \$250 for one in marked condition up to about \$375 in mint condition. When you see one advertised, don't hesitate, they don't last long!

THE YAESU FT-7B

This has the same appearance as the FT-7 but the output power is increased to about 50 watts CW and PEP. AM is added to the other modes, a receiver front-end attenuator is selectable by putting on the microphone gain control, a drive control is now concentric with the tune control and the band-switch now has positions for full coverage on the 10 metre band although only one position is fitted with the required crystals as standard. Again this is 28.500 to 29.000 MHz.

In general, the 7B has never enjoyed the popularity of its smaller brother. Released in late-1978 the price was around \$600. Secondhand value now would be about \$475.



THE YAESU FT-707

The FT-7B was superseded by the 707 in early 1980. Appearance was changed completely and the initial impact was excellent. Full amateur band coverage from 80 to 10 metres including the new WARC bands was provided in 500 kHz segments and a bright and very readable digital readout accurately indicated the frequency. But, the most controversial aspect of the 707 was the LED meter. You either like it or you don't and most didn't. It seems that where most have accepted LED meters on VHF transceivers, the FT-707 experiment proved that they are not liked for HF.



The version of the 707 sold in Australia had 100 watts output, but apparently a few of the 707S transceivers found their way here. Watch out as these are a 10 watt output version and are worth somewhat less.

General performance is reasonably good however the VFO is not as stable as it could be and the transmitter talk-power seems light on. There is no speech processor provided.

The main competitor of the 707 is the Kenwood TS-130S which, I feel is a much better performer in this price range. However, as a portable/mobile, or as a second unit for home, the FT-707 is worth considering for the right price. A number of optional accessories were offered with the FT-707. These included the FV707M digital VFO. This unit, only about 25 centimetres high, is a push button operated memory, VFO and scanning system. It has no display built in, and relies on the display on the transceiver. I found it rather fiddly to operate and not a great advantage.

The FT-707 power supply is a nice unit. It has a built in speaker and, as well as a captive lead with a matching connector for the 707, it has a pair of terminals for auxiliary equipment. The matching ATU, the FC-707, is also a nice little unit. It has built in power meter with 15 and 150 watt scales plus a built in dummy load. The only thing against it is that it does not have 160 metres.

Secondhand values: FT-707 about \$600, FT-707S about \$450, FV707DM VFO about \$150, FP-707 power supply about \$250 and the FC-707 ATU about \$225.

THE YAESU FT-107

This was the last of the 'first' fully solid-state transceivers. It had all the signs of being highly successful in the amateur market but, for some strange reason, was only available for a relatively short time. Released in early 1980 at a price of \$1150 depending on options selected. It was one of the first solid-state units to have a built in AC power supply. Actually the built in AC supply was an option, but I have yet to see a 107 that didn't have one.

An external AC power supply was available and, at the end of the run, these were sold off at most attractive prices. The first of the 107s covered all the HF bands including 160 metres, but not the new WARC bands. According to the advertisements of the time a kit was to be



HINCH AT SEVEN DAMAGES REPUTATION OF AMATEUR RADIO SERVICE

MEDIA MISREPRESENTATION OF AMATEUR RADIO

Following is the text of a news item broadcast on the AX2WI Broadcast.

available to give WARC band coverage. I am not sure if one appeared! However, it was not long before 107's with the WARC bands installed came onto the market. With provision to take an inbuilt AC power supply, the 107 was similar in size and weight to the valve final transceiver, such as the FT-101Z series described last month. A digital readout was a standard fitting and a 12 channel memory was available as an option. With a memory selected it was possible to VFO it up and down the whole band, either from the control on the transceiver front panel or via the up/down buttons on the microphone.

It should be noted that, unlike the memory system on modern general coverage transceivers, these memories were on one band only. Flipping the band-switch from say 40 to 20 would bring the memories to the same relative position on the selected band. An excellent notch/peak filter and variable bandwidth control were standard fittings. All in all, they offered a high standard of performance. Why Yaesu dropped them so soon is a mystery. These days owners of FT-107's prize them highly.

Secondhand value of an early (pre-WARC) model with in-built power supply and DMS (memory) would be about \$700. A later model with the WARC bands, power supply and memory, about \$775.

In addition to the external power supply mentioned above, several nice accessories were available. The FC-107 ATU rated at 250 watts would have a secondhand value of about \$225. A transverter that can be optioned to take two bands from either of the 430, 144 or 50 MHz ranges. It would be worth about \$150. The external VFO, the FV-107, was also sold-out on special and its secondhand value would be about \$60.

Next time, we will look at the last of the Kenwood valve-final Kenwood transceivers.

1989 SUBSCRIPTION PRICES FOR VHF COMMUNICATIONS MAGAZINE

Although the German price has remained the same for 1989, due to currency fluctuations and the increase in our overheads, the 1989 subscription through the WIA Executive Office will be:

Airmail Subscription
Surface Mail Subscription

\$28.00

\$32.00

PEACE DIGITALKER

AMSAT-Brazil plans to launch early next year the Brazil Pasceatler — a multi-lingual satellite beacon.

Using a speech synthesiser it will transmit a peace message in the English, Russian and Portuguese languages.

The beacon operating two-watts FM on the two-metre band is also to give out its routine on-board telemetry through the digitalker.

Last Tuesday night on television Channel Seven's nightly program *Hinch at Seven*, and also in the Sydney newspaper the *Daily Telegraph*, there was an item concerning interference to a marine Mayday call. Hinch reported that the signal, which originated off the coast of Wollongong was jammed by ham radio operators thereby hampering rescue attempts and placing lives in jeopardy. The *Daily Telegraph* reported (and I quote):

"... a third complication arose when the distress signal frequency became jammed by a ham radio operator who was interfering with the marine distress frequency."

(end of quote)

Nothing could be further from the truth.

Upon hearing this item, some amateurs telephoned Channel Seven to obtain more information. When this proved to be a waste of time, these amateurs went right to the source, that is the rescue authorities are also annoyed in the manner in which the item was broadcast.

The truth of the matter is, a call was heard which stated that there was a Mayday four kilometres off the coast of Wollongong. No further information was given nor could the unidentified station calling Mayday be traced.

The authorities had noted that for sometime that evening, the radio conditions were such that there was an enormous amount of "slip" present and the frequency of 27.880 MHz was extremely noisy. Also, this frequency has, in the past, suffered image interference from local CB operators.

According to the authorities, the interference to the distress frequency was due to the "slip" conditions present that night. This fact seems to be irrelevant to the media, who think that the story would sound better if something for someone more tangible was to blame. So who is to blame? The media consider anyone even remotely interested in radio (CB, amateur or otherwise) to be a "ham radio operator". We are the scapegoats! There seems to be some truth in the old saying "why let the truth spoil a good story?".

While some could forgive them for not being knowledgeable enough to distinguish between amateur, CB or private commercial stations, the fact remains that the public have been told that "ham radio operators" were responsible for the interference to a distress signal. What image does this place into the public's eyes of us — the amateur radio operators? Not a good one we can assure you!

When Channel Seven was approached by the VK2 Council, they freely admitted that the facts were not totally correct and that they had not told the entire story. They were asked to broadcast a correction to the item but at the time of writing this, none has eventuated.

The VK2 Council are writing to Channel Seven and the *Daily Telegraph* to attempt to set the record straight and get a correction item broadcast.

We ask that all amateurs do likewise. The more letters that Channel Seven and the *Daily Telegraph* receive, the more likely that they will actually do something about it. It is most important that our hobby not be degraded by this inaccurate act of journalism.

Please support this by writing into Channel Seven and the *Daily Telegraph*. It is the reputation and public image of our hobby that is at stake!

SUPPORT

The WIA Victorian Division fully supports the actions of the New South Wales Division in the above matter.

It FAXed a protest letter to Mr Derryn Hinch. On the VK3BW weekly broadcast, members were encouraged to telephone and write to the Hinch at Seven program which is headquartered in Melbourne.

The WIA Victorian Division then decided to leave further representation to the New South Wales Division. This was because the WIA needed to speak with one voice and not by two Divisions.

The New South Wales Division is close to the action, the rescue groups and the DOTS District Radio Inspector, also the *Daily Telegraph* is a Sydney newspaper and appropriately should be rebuked from within its primary readership area.

times, starting with JA1 and JA2 then moving to JA6 and JA7, etc. Signals were generally peaking to S9.

JAS6DJ informed Peter that he had worked VK2, 3 and 5 plus a 3D2 that day. JA4M6M was heard to say that a 5H1 (Tanzania) station had been worked in Japan.

At one time Peter came across VK4ALM and VK5NY in contact, amongst the JAs but he could not determine if either of those operators were still hearng JA stations. VK4ALM had a very steady signal so it was presumed the signal was coming direct and not via backscatter from JA.

Peter said the warning that the band might be open came from 10 metres, where JA signals were becoming very strong. A check on six metres revealed the band was open with signals. The reasons JA2GY on 50.011 J66Z H on 50.020 and JA7ZMA on 50.028 MHz were all audible thus verifying the correctness of the published beacon list. Thanks for the news Peter.

GOOD SPORADIC E IN JAPAN

Through June and July 1988, the Japanese stations enjoyed many periods of excellent E conditions. As an indication of what stations are around during such openings, many of which could eventually be available to VK and ZL stations, the following is presented for your information. Most of these were operating around 50-100 to 150 MHz.

HL3CB, KG8DX, KH-2D, H44DL, H44GP, KX6DS, V56KRC, HL9TM, 5W1GR, HL2AOS, HL1WV, HL2AMH, HL0BIC, H33EX, P29EEF, HL1NQ, HL2ASH, 8Y1PK, 8Y4AA, HL1AY, HL1VR, HL0BFO, KL7IKV, AL7C, HL1ST, V56XWR, 9V05, N7FX, N7DB, K7RWT, W7FIM, W7FN, N7ML, W7CE, K1GO, K5MM, K17NO, K7BJU, KH6 J, AH6IO, KH6VP, KH6FO, KH6SB, KH6IA, KH6HI, HL6FI, V56XW, WA6JRA, K7GJ, KH6CP, K66C, K8QXY, WA6BYA, W7AEK, W7QX, K6HAC, KH8CH, D10EFZ, JD1YAA and T20AA.

The most prolific stations were the HL prefixes, then KH6. There were a lot of contacts to the US mainland, the special DXpedition station, 9V1ES, in Singapore, received a lot of attention. Many contacts have also been made with stations in northern VK4 and an odd contact to VK8.

The distance from Tokyo to San Francisco is around 8000 kilometres (5100 miles) while from Sydney to San Francisco is about half as far again, at more than 12 000 kilometres (7500 miles). The journey for VK stations to work the US also involves crossing the equator, so it needs a set of good conditions for contacts to occur. The path from Auckland to San Francisco is shorter by some 1000 kilometres or 620 miles, which seems sufficient on many occasions, for contacts to be made from there with more ease than from Australia.

Thanks to Graham VK6RO for supplying the news from the Japanese CQ ham radio magazine. John VK4PU, also sent a communication covering similar news for which thanks are also tendered. John said he had received a state visit from Yoshi JR2JDX, who also holds the Australian call sign JA4BYM.

While we are still looking at Japan, David VK3AUU, said that during September there had been several appearances of JA stations, mostly with weak signals. Rob VK3JQ worked several on 19/9 around 1130 UTC, but David heard only JASCMQ very weakly on 50.040 MHz. David also reported that Rob's signal had a rough character about it something akin to aurora, but not so pronounced. Such characteristics have been noted before when six metres has been trying to open to the north.

OTHER NEWS

Fred VK2YZU, from West Esping, writes to say that he has returned to operating after a break of 10 years. He is a former VK4 and is now active on six and two metres, using a TS-600 and 10 watts to a four element Yagi on six metres and a TR751A

with 25 watts to a six element Yagi on two metres. He said it is a humble return to VHF (Maybe, but you are back Fred, that's more important. I will look forward to hearing from you as events unfold. VK5LP).

Charlie VK3BRZ is sending details to the WIA Awards Manager, of a proposal to institute an award for contacts with 100 Grid Locator Squares, with endorsements for particular bands. It is suggested that the award commence from January 1, 1989. Operators to exchange their Grid Squares and signal reports. The object of the award, amongst other things, will be to encourage activity on the bands.

Charlie has said account should be taken of the activity of any operators who go our portable to give others the chance of working remote squares. By so doing, they normally deprive themselves of an opportunity to work rare locations. Recognition should be given to the portable station as having worked the square from which he is operating if he is able to work another operator in the same square as his own base station.

If operators have any input regarding the matters mentioned in the above two paragraphs, then it is suggested you write to the Awards Manager outlining your views and comments so the Manager can consider all relevant points before approving the Award.

The back page of the Newsletter of the South East Radio Group Inc at Mount Gambier, carries the constructional details of a two metre coaxial power divider. Those contemplating stacking antenna arrays may find the project worthy of consideration, as it appears to be a very sound and reasonably priced approach to provide what is normally an expensive item. It was constructed by VK5KMP, the Engineering Consultants being VK5NM and VK5ZOO. I am sure a SASE to SERG, PO Box 1103, Mount Gambier, SA 5290, would see a photocopy arriving at your QTH.

I recently received a telephone call from Graham Alderson ZL2AAD, whilst he was in Mount Gambier, at the QTH of Trevor VK5NC. It was good to talk to Graham again. My first direct contact with him was in 1980 when I spent an evening with him at his Christchurch home, discussing EME and the construction of parabolic reflectors. Graham said he is currently experimenting with EME on 2304 MHz, after successfully achieving results on 432 and 1296 MHz.

THE ROSS HULL MEMORIAL CONTEST

At the time of writing these notes at the beginning of October, no details of the 1988 Ross Hull Contest have emerged, so I am unable to make many comments.

However, it would be safe to urge as many as possible to enter the contest and equally as important, submit a log of your activities. As VK5LP and my prime interest being VHF and UHF, I have tried for years to increase the log entries, without a great return for my efforts. I have written pages on the contest, I have reported pages of information from others, so much so, I get the feeling at times, that were the matter being dealt with by some government departments, the matter would be placed in the "too hard" basket!

I am encouraged by receiving advice from Charlie VK3BRZ, that he and Mike VK3ASQ, will be journeying to Mount Cowley, in Grid Square QF11 for the start of the Ross Hull Contest. They will be operational on 52, 144 and 432 MHz and hope their portable operation will assist in generating other contacts and provide a well located station for DX contacts.

This advice brings memories that some years ago, many operators went out portable, mainly from VK3 and VK5, but some other States too. VK5LP has been mountain-topping on and off for nearly 30 years, others have been doing so for a similar period. In the early days, we had cumbersome AM valve equipment, with heavy modulators and power supplies, connected to an equally heavy alternator, but we had a lot of fun.

Today, most equipment is already in the portable category, light efficient, and with adequate power. Many units can operate using multiple modes and are connected to small lightweight alternators. There are many more aids to make camping on the same windy, and sometimes cold, hill-top much more comfortable than bygone years, yet less and less people seem prepared to make the effort to go out to an often better location than their home station, thus providing more contacts, also enjoying the fun which can be part and parcel of a hill-top expedition. A portable operation could be mounted from a unit sitting on the front seat of a car, connected to a small beam antenna with its mast tied to the door handle and rotated by hand from the comfort of the car — as simple as that!

As the years go by, like everyone else, VK5LP is getting older, but I still find it difficult to remove the bug of portable operation from my system. So much so, that I should recently I was giving consideration to whether I should go out portable during the Ross Hull Contest this year. My better sense told me I should stay home and if less my otherwise quiet good home location, but my lesser sense told me I ought to go out again before I get too ancient! However, I have decided that if the period of the Ross Hull Contest is long enough to warrant the mounting of a hill-top expedition, I will probably go, but if it is going to be only for one or two days of the month, then the effort to operate portable with at least three bands a hardly worth the bother. Hopefully, I will know the details when November AR is received.

Before closing this portion on Contests, did you by any chance notice that the single entry using VHF for Worked All Stations, means powered, of the John Moyle Memorial Field Day Contest — 1988 was VK5LP. Although I was unable to participate as a portable station, from my home station I had nine contacts (including one using CW) with portable stations, for a points score of 455.

FROM THE USA

Although the first copy was published at the end of 1987, a new publication has come into my hands in the form of *The International 6 Meter Digest* and published by Harry A. Schools KASB. Within its pages there are a number of interesting items which are not readily dealt with the passage of time, dealing with the profiles of some well-known six metre operators of the world.

The first is about Jorge CX8BE, of Uruguay, who reports very little 50 MHz activity from Uruguay, with what there is concentrated in Montevideo, the capital. There are 15 stations capable of operating on 50 MHz, all on AM, except that CX8AV, CX8BBF, CX1DDO and CX8BE are active on SSB. Most operators are not interested in VHF/UHF due to lack of contacts.

CX8BE has been active on six metres since 1958 and was the first station in Uruguay to utilise SSB on six and two metres. So far, Jorge has worked 42 countries on 50 MHz. He runs a beacon at times using 10 watts output.

A very well-known operator to Australian stations is Joe Chalmers KG6DX, from Guam. Joel has lived on Guam for 13 years and was active through Cycle 21. During the cycle, the 50 MHz band was open to the US mainland for five years, 1977 and 1978 were marginal, 1979, 80 and 81 were great.

November 1979 started with an opening to VE1 and W1, and followed sunset across the States. By November 1980, Joel had worked 48 US States, the two elusive ones being Louisiana and Wyoming.

From his viewpoint, Joel said Cycle 22 started in April 1987 with openings to Japan, 1500 miles (2500 kilometres), and plenty of television sync signals from UA. He believed these openings were TE related, as the JAs were working into VK via their typical TE path. Guam is in a high MUF area, located 13 degrees above the equator and 14 degrees above the magnetic equator. During the peak years of the last cycle, six metres was open 24 hours a day! The best path was into Brazil. He could hear the PY2AA beacon in the morning

whilst beaming towards the east and again at night while beaming towards the west. Brazil is halfway around the world from Guam. Looking eastwards, Joel says the distance is slightly less, so he calls that the short-path, the western path is the long-path! The JAs would regularly work Argentina on morning TE and 5B4 (Cyprus) and EL (Liberia) on long-path in the mornings. The JAs also had openings to KP4, 6Y5 and KP2, etc on long-path at night (1 am) on some kind of TE hook-up which was not audible in Guam.

Joel has been using a three-element beam up 20 feet and connected to an IC-551D at 100 watts. A 6N2 Tempo amplifier is presently gathering dust, but may be pressed into service if conditions continue to improve. He also runs a beacon from Lme to time, either on 50 100 where it sends VVU de K6GDX Guam QK23KL, or 50 110 where it calls CO. He usually points the antenna to the USA from 0 to 0:00 UTC, towards the south from 0:00 to 0:30, then towards the north-west from 0:30 to 1:00.

THE LOCAL SCENE

Having been away for a week or two visiting Expo 1988 in Brunei (which was thoroughly enjoyed), I returned home to find that Minnie had been buffeted by some heavy winds in my absence, causing the driven element of the six metre beam to break off at one delta-match feedpoint. This has been most unfortunate as that type of break completely deadens all signals. Hopefully, my friend David VK5KK will be able to climb the 70 feet to the antenna at an early opportunity to affect repairs which will enable me to share some of the good conditions which have been prevailing whilst I have been off the air!

In the meantime, I have gathered the following six metre news from Roger VK5NV, Roger VK5PZ. There was a small opening to Japan on 13/9 with JAT and JAB being worked. On 19/9 there was a big JA opening to all areas, with pages and pages of contacts. The band opened again to JA on 21/9, also to New VK8ZCU at Tennant Creek. On 30/9 VK2 was worked.

A most interesting day occurred on 1/10. The JAs were in, ever, then a brief contact with VK4ALM, at 0905. Early in the day of missing valuable contacts. Roger kept all contacts short. At 0913 he worked VK8ZMA, in Alice Springs, then VK8GF and VK4DO. At 0955 UTC the band opened to Hawaii with KH6HI being worked at 5 x 3, later his signals rose to 5 x 7 when he was observed working P29. At 10:15 Roger heard an American voice signing KA877 but due to the incessant QRM from the JA stations he was unable to decipher the call or make a contact. Roger said it was obvious the opening was favouring the Pacific area, even the JAs were peaking in that direction rather than on the direct path, so the contacts were probably made by the F2 mode.

Six metres opened again to Japan on 5/10 with good signals from 1238 to JA2, 5, 6 and 9. VK8ZCU was worked again, also Alice Springs and VK4.

Reports are filtering in that east coast VK4 stations have already been working to the USA coast, so it looks like my antenna failure has come at a most inopportune moment.

A though all eyes and ears turn to six metres from much of the time, the moment, there are still these few regular contacts on two metres and 70 centimetres taking place between VK3 and VK5 by the dedicated operators.

OVERSEAS BEACONS

I note that a recent Japanese list of overseas beacons includes a number well-known to me. I list them here and suggest you extract the details and keep them near your operating position for reference.

50.004 PY1RO, 50.015 SZ2DH, 50.025 6Y5RC, 50.030 CTOWW, 50.033 ZDBVHF, 50.035 ZBZVHF, 50.038 HC1JK, 50.036 FY2THF, 50.040 OXSVHF, 50.045 VESBFC, 50.060 PY2AA, 50.067 WABLZ, 50.080 HCSB, 50.080 T2NA, 50.085 9H1SX, 50.089 WA6JRA, 50.090 ZF2KZ, 50.500 5B4CY, and 50.500 FK8KAB.

How many of the above lists are actually operating I cannot say, this being one of the main reasons I do not list them. Suffice to say, the segment between 50.000 and 50.100 is full of beacons when viewed on a world-wide basis. At best, one can only listen, if you hear a signal, please note the call, frequency and time, also make a tape recording of the identification. In this way, you are more likely to be believed when you claim such a hearing rather than the matter being placed on the query list in the absence of verification; eg I have just heard rumours that Portugal had a contact with Indonesia on six metres! As far as I am aware, there are no six metre stations in Indonesia, the only operations from there have been by Japanese stations mounting DXpeditions. See what I mean!

LATE NEWS

Following the receipt of several telephone calls, the following late news has been compiled in relation to six metres.

Peter VK8ZLX, for Alice Springs, reports almost daily contacts with JA. Also, HL9CB is active most nights and will soon be going to DU for a while where he will be on six metres. Peter said JA1VOK, told him that JA had worked into Malta (9H1) on 9/10.

Graham VK6RO, said that as a result of a large solar flare, they had an excellent opening to Japan extending over six hours from 0500 to 1100. Graham worked 40 JAs and also confirmed that HL9CB was going to DU.

Wally VK4DO, from Airlie Beach, phoned on 12/10 to say they had had an incredible day. From 0245 he worked K16CG, W5FF, K5FE, NSJNH, WA7EPU, all from the USA mainland, with signals to 5 x 6. Ross VK4RO, was also heard working the US stations.

Wally said KH6 has been available almost every night. HL9 is a regular contact and also confirms HL9CB will operate from DU as from January 1989. During the past few weeks there has been much television from Asia, and recently he received a noise free picture from Russia (the sound was missing due to being 6.500 MHz from the vision carrier), also KH6AIA has recently worked JA, W, HC and PY Areas available to VK4 include VK, ZL, P29, HL1, HL2, JA, H44, KG6 and KH6 plus W.

There was also a report that a two metre contact had been established between Bowen/Mackay area to New Zealand around 5/10. Also, Wal VK4AIV, apparently worked ZL on 70 centimetres.

Finally, John VK4ZJB, advised working K6HCP at 5 x 9 at 0200. The US station runs a mere 1600 watts! Others were K6MYC, K6QXY, both 5 x 9, N6AMG at 5 x 8. Then at 0945, KH6AIA. Others involved included VK4PU and VK4ALM. K6GDX, on Guam, was also worked plus HL9CB and HL9TM. John said this may be the first time ever that the US mainland has been worked from VK during the Spring period. The A index was a high of 53, so obviously a very active solar flare was involved.

Har JA1VOK, wrote to say that JR6HI, in Okinawa, worked SH1HK, in Tanzania, at 1634 UTC, on 27/9 and PY2BBL, at 0211 on 28/9 for the first time this cycle for Japan to Africa and Japan to South America. SH1HK uses an IC-551D and six element Yagi. The contacts were on 50.110 and 50.130 MHz respectively.

CLOSURE

If normal summer-time propagation prevails this year, instead of the failed conditions of last year, we can expect a lot of six metre contacts during November and December. These should include extended Es contacts from various island nations of the Pacific region. But, whilst six metres may be very busy, do not overlook the Es potential of two metres.

This December issue commences the 20th year of my involvement in these columns. At the 10 year mark I prepared a separate article reviewing the

previous 10 years of VHF/UHF activity. Perhaps such an article should be considered following December 1989.

Whilst extending my Seasons Greeting to all my readers, on-air friends and the Editor and staff of AR magazine, I hope 1989 will be the type of year which brings some joy into your lives and those around us.

I wish to once again thank all my correspondents, who, in some cases have been regular contributors, either in writing or by telephone for many years. I am grateful for all help received and the many comely monetary letters I receive from you and readers in general. I am very indebted to the constant flow of material which comes from my friend, Bill Tynan VK6CO, from "World above 50 MHz" in QST. With access to many more operators than I, Bill always seems to have something worth reporting in his columns. When all put together, the overall support received has made the prolonged effort in producing these columns worthwhile.

Closing with two thoughts for the month "At this period of Christmas, it is well to remember that the Lord gave us Commandments — He didn't mention amendments" and "The turtle lays thousands of eggs without anyone knowing, but when the hen lays an egg, the whole country is informed". 73 The Voice by the Lake.

AMATEUR RADIO IN YUGOSLAVIA

We have received a letter from Vladimir Markovic YU1ANV, of which copies appear to have been sent to a number of amateur radio magazines around the world. The purpose is to tell us, in effect, that amateur radio is alive and well in Yugoslavia, and to give some idea of the way in which it is organised and the range of activities. As in Australia, many radio clubs are active. All are constituents of the Radio Amateur Federation of Yugoslavia (Savez radio-amatera Jugoslavije). In turn, there is a close connection between the clubs and their association and the "mass organisation" for the popularisation of science and technology called People's Technica (Narodna Techna ka). This is further connected with the professional engineering institution, the House of Engineers and Technicians of Serbia (Dom inženjera i tehničara Srbije).

Vladimir's club is named "Kosutynak" and is located in the Belgrade suburb of Rakovica. He operates CW, but the club members have been active in packet radio and computers since 1986, and form part of a countrywide 144 MHz net.

The letter gives a list of many of the Yugoslav clubs:

Radnik (The Worker)	11090	Rakovica
YU1XOT		Belgrade
Bratstvo-Jedinstvo	11000	Belgrade
Cedus (at the University of Sarajevo)		
Miladin Popovic	71000	Sarajevo
YU6FF6	38400	Prizren
Duro Opacic		
YU6KZE		Avajila
Boris Kidric	YU8ALB	38230
Rudi Cajavac		77240
Partizan	YU860P	75320
Kosmaj	YU7AKU	38250
Herceg Pinki		21000
Vuk Karadzic (i)		
YU7AKE	21243	Kovij
Vuk Karadzic (ii)		
YU7AJN		Budisava
Nikola Tesla	YU1AH1	11000
		Vracar Belgrade

Amateur 68290 Semnica, Triglav 61000 Ljubljana, Letna 64000 Kranj, Nikola Tesla 75300 Brcko and Elektron 38000 Pristina are also listed without call signs.



Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright, Vic. 3741

KIT REVIEW

Hi Morsies. This month I want to feature a low power transmitter kit from C.M. Howes Communications, in England, which was sent to me by Dick Smith Electronics for evaluation. If you are new to amateur radio or want to try QRP home-brewing for the first time, then this kit is a "little beauty". Its construction would also provide some essential help in understanding some of the theory, for those who want to sit for their exams with plenty of preparation.

One thing I can say is, that building the kit is easier done than said. After spending 15 minutes reading the five pages of instructions, I managed to wind the five inductors in about 30 minutes and then spent an hour assembling all the components on the board. The board measures 125 by 5 centimetres and the only external components required are a key socket, antenna socket (or relay) and a crystal changeover switch, should you have more crystals on hand. The instructions provide very detailed diagrams and a component list which includes space to tick off each item as you install it on the board. All component numbers and polarities are printed on the board complete with labels for individual leads, where appropriate, so it is almost impossible to make a mistake at this stage. As long as you don't splash solder all over the place there is very little chance that anything will be wrong when you "power-up".

Following are some brief specifications.

output power	better than 40 dB down plus key-click suppression
crystal frequency	5.779 5 MHz supplied and on board
supply voltage	provision for external VFO and two more crystals
output conditions	nominal 13.5 volts at 500 mA approximately 50 ohms unbalanced better than 21 VSWR recommended output transformer will sur- vive bad match

Having assembled and tested by eye, one might think that all that is needed is to "lure it up" and that is the end of the story. Not true. The best is yet to come, and nothing beats the feeling you get from hearing the oscillator doing its task, except maybe the first contact you have with another amateur.

Detailed tuning-up instructions are provided and you will need a power (or SWR) meter and a dummy load. There is one slug to adjust in the oscillator, then you set the required power level

with the preset potentiometer. Using a 13 volt supply I found the maximum power to be 4.5 watts so I backed off to four watts before connecting the antenna. The heat sink became only slightly warm during the testing, so there should be no need to worry during normal Morse operation.

Connecting the unit to my trusty long wire antenna, the only one I have which will tune 1:1 at that high above the CW section, I started calling CQ. The station receiver provided ample side-tone for easy sending, and it was connected to the 160/80metre dipole. It is a good idea to have a switch on the supply to the transmitter because the constantly running oscillator will draw out signals in the receiver! It was necessary for me to pull-the-plug on the transmitter when listening for a reply. After a few calls I received a reply from Ken VK3PKE, near Frankston, which is about 350 kilometres from my location. He gave me a signal report of five by nine, and on his second over said, "home-built transmitter is doing a great job, sounds very nice. Looks as though you might have to get some more rocks for it. Very nice to meet you. . .". For a first contact I think that is pretty good!

I used a hand key for that contact, but later the same evening I tried the electronic keyer (8044ABM) and the transmitter sounded okay in the station receiver, even at 30 WPM there was only a trace of key clicks, but that is only to be expected when monitoring your own signals. I then worked Karl VK7CW, in Somerset, and he gave me a 599 RST report, and clean tone under very noisy conditions. I arranged the contact by tail-ending on 3.530 MHz with eight watts on the main rig and asking him to listen on 3.579.5 MHz. Thanks Karl.

The CTX 80 transmitter kit from Dick Smith Electronics (Part No. K6322) is one of a family which include a VFO (K6327) and direct conversion receiver (K6328), all for operation on 80 metres. At the time of writing, the transmitter kit costs about \$50 and stocks are okay! I hope to publish reports on the other kits in the near future, and as building-time permits. Thanks are extended to John Links of Dick Smith Electronics for kindly supplying the review kit.

Readers may remember another kit I mentioned in the column a few months ago. It was the Club Communicator Kit-set from the CW Operators QRP Club. You will notice therefore that the CTX 80 is a simpler kit, but with the addition of a VFO it would be a worthwhile project for home-brew beginners — or just for those who like the thrill of building their own equipment. The receiver kit would be great for a study aid and for listening to the Morse broadcasts in order to practice for the examinations. I am looking forward to seeing it.

It seems to me that suppliers are again taking an interest in amateur kits, so the more support we give them, the more kits that will be available for everyone.

If anyone knows of a supply of crystals for the

CW end of 80 metres, please let me know so that I can pass the information on to other amateurs. And, don't forget to have a listen on 3.579.5 MHz for those with television crystals. Unfortunately, it is a noisy frequency so you will have to listen intently.

FIFTY YEARS AGO . . .

"Quite accidentally the British have made the discovery that the metal structure of an airplane in flight collects and re-radiates or reflects the ultra-shortwave impulses employed in television broadcasting, so that receiving sets produce a double, or 'shadow' image. The shadow image is formed by the waves that reach the television receiver directly and by those that rebound from the plane flying within range. It was also discovered, still be accident, that the width of the shadow image cast by the airplane reflections bears a definite relationship to the plane's distance." . . . from *Scientific American* August 1936.

Having myself worked a little "aircraft enhancement" mode on two metres, this snippet caught my eye, even though it is not a Morse subject. I wonder who made the discovery and whether they went on to the discovery of radar from observations such as

CAN WE HELP?

You may have read in October AR about the amateur who reads Morse through his fingertips because of his deafness. I wonder whether reading a flashing light by eye would be easier. I would be interested in hearing from any deaf amateurs who have solved their problem in some way. Even if you have not thought of a solution before, it might be well worthwhile considering what you would do should your hearing fail. There seem to be a number of blind amateurs, but I have never worked a deaf amateur. Maybe our ideas could help!

JOHN MOYLE RESULTS

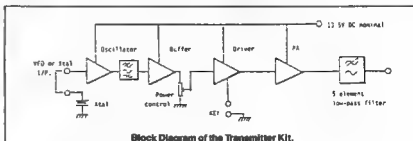
I was very disappointed to see the results of the John Moyle Field Day Contest in October AR because, it seems that I was the only operator in Class b to enter a log. Class b is the single operator, portable field station, CW section. Surely there is someone else willing to help show the flag in this annual contest. Does this mean that, in an emergency, we will have to rely on the voice modes? What if the conditions are bad? How do you know you could operate in an emergency if you don't make the effort to practice on the one weekend in the year when the chance is offered? This is what the contest is all about, you don't have to "knock-yourself-out". Even the six-hour section had no entrants this year. Fair enough is you have other commitments on that day, but in a real emergency you will not be likely to give in to laziness or moods, so if you want to keep the spirit of amateur radio and Morse code alive, how about entering in 1989!

73 and Merry Christmas.

Gil VK3CQ



The completed unit.



Block Diagram of the Transmitter Kit.



AMSAT Australia

Colin Hurst VK5HH

8 Armadell Road, Salisbury Park, SA 5109

NATIONAL CO-ORDINATOR

Graham Ratcliff VK5AGR

INFORMATION NETS

AMSAT AUSTRALIA

Control VK5AGR

Amateur Check-In 0945 UTC Sunday

Bulletin-News, 1000 UTC

Primary Frequency 3.685 MHz

Secondary Frequency 7064 MHz

AMSAT SW PACIFIC

2200 UTC Saturday

14 262 MHz

Participating stations and listeners are able to obtain basic orbits, data including Keplerian elements from the AMSAT Australia News.

This information is also included in some WIA Divisional Broadcasts.

APOLOGY

I must apologise for the absence of notes in last month's *Amateur Radio*. Due to an overseas work assignment I managed to get a little disoriented time-wise, upon my return to Australia and overlooked the Editor's deadline for copy.

AMSAT-AUSTRALIA NEWSLETTER AND SOFTWARE

The fine monthly publication *AMSAT-Australia* Newsletter published on behalf of AMSAT-Australia by Graham VK5AGR, now has 280 plus subscribers. Should you also wish to subscribe, then send a cheque for \$20 made payable to AMSAT-Australia and post to: AMSAT-Australia, C/- PO Box 2141 GPO, Adelaide, SA 5001.

The Newsletter provides the latest news items on all satellite activities and is a must for all those seriously interested in amateur satellite activities.

Graham also provides a Software Service in respect to general satellite programs made available to him from various sources. The only requirements to make use of this service is to send Graham a diskette nominating your requirements, a nominal \$10 donation to AMSAT-Australia and sufficient monies for return postage and packing. To obtain details of the programs available and other AMSAT-Australia services, send an SASE to Graham.

UNIVERSITY OF SURREY ACTIVITIES

Summarised from UoSAT Bulletins 148-153

UoSAT-D and UoSAT-E on Ariane

Changes in the NASA-USAF launch manifest have resulted in the postponement of the UoSAT-C mission, originally scheduled for launch on NASA-DELTA in late 1988. Simultaneous with the news of this delay, however, UoSAT signed final agreements with ArianeSpace for the launch of two UoSAT satellites into an 800 kilometre, polar, sun-synchronous orbit on Ariane with the SPOT-2 primary payload in early 1989. The Ariane launch opportunity — secured after long negotiations amongst UoSAT, AMSAT-Australia and ArianeSpace — involves a total of seven payloads: SPOT-2 (a replacement for the SPOT-1 imaging satellite), UoSAT-D, UoSAT-E and four AMSAT-NA MicroSats. UoSAT-D and E will now take over the mission objectives of the postponed UoSAT-C mission to support:

- * amateur radio packet store-and-forward communications transponder;
- * studies of the orbital radiation environment,
- * on-orbit demonstration and evaluation of novel spacecraft technologies,

* further development of low-cost CCD Earth imaging techniques.

The UoSAT-D and E spacecraft, accompanied by the four AMSAT-NA MicroSats, will be placed around a new Ariane structure — the Ariane Structure for Auxiliary Payloads (ASAP) — specially designed to provide small secondary payloads with inexpensive launch opportunities.

Due to mass limitations on the Ariane ASAP, the payloads originally intended for UoSAT have had to be split between two spacecraft (UoSAT-D and E). The two UoSAT spacecraft will be structurally identical, and have identical housekeeping subsystems, but will carry different payloads. UoSAT-D will carry an amateur radio digital store-and-forward communications transponder operating in the amateur satellite service, and also investigate the effects of the space radiation environment on spacecraft components — funded by the University of Surrey, the Royal Aerospace Establishment (UK), AMSAT-UK, AMSATUK and VITA (USA). UoSAT-E will support in-orbit technology demonstration and CCD camera experiments.

The primary payload on UoSAT-D will be the Packet Communications Experiment (PCE) which was originally to be carried on UoSAT-C. The PCE is an orbiting packet node with four mega-bytes of message storage space and advances the work done on UoSAT-2 with the Digital Communications Experiment. The PCE system (hardware and software) is being developed under a contract from the Volunteers in Technical Assistance (VITA), who hope in the future to use store-and-forward communications as a link with development workers in remote areas. The flight of the PCE on UoSAT-D and its use by radio amateurs is funded by the University of Surrey and AMSAT-UK.

All amateur radio stations with appropriate equipment will have open access to the PCE via AX.25 packet radio. The UoSAT-D-PCE will use 9600 bits/second, frequency-shift-keyed (FSK) uplinks and downlinks. These channels will be compatible with existing modems from G3RUH and K9NG. The spacecraft will operate in Mode-J, with one uplink in the two metre band and a downlink in the 70 centimetre band. RF communications links should be good enough to provide a consistent service to ground-stations with modest non-steered antennas. An experimental high-power downlink mode for very small ground-stations will also be included.

Whilst the UoSAT/AMSAT-UK PCE will use standard AX.25 communications links, it will also provide a platform for experimentation with higher-level packet communications protocols. Current 'PACSAT' systems employ ALOHA access (each station transmitting when it wishes to) and user interfaces based on terrestrial BBSs. The PCE will employ experimental access techniques aimed at more efficient machine-to-machine communications. The user-friendly BBS-like interface will be on the ground, in the ground-station's personal computer or TNC. The ground-station and the satellite will communicate using high level protocols, making the best use of short satellite passes. Software to support these ground-station-to-satellite protocols (along with complete specifications of the protocols) will be developed at UoSAT and made available to the amateur community.

The PCE will be controlled by a 80C186 microprocessor running at 8 MHz. The 80C186 is a highly integrated microcontroller with integral direct memory access (DMA) controller, interrupt

controller, timers and other peripherals. With a full 16-bits bus running at such a high speed this processor will have adequate computing power to control all of UoSAT-D's housekeeping concurrent with the packet radio communications system.

COSMIC PARTICLE EXPERIMENT

The PCE will provide an active package to characterise the radiation environment experienced by the spacecraft in orbit which affects on-board semiconductor devices — causing displacement damage to bulk devices (eg solar cells) and single event upsets (SEUs) in VLSI memories. Silicon diodes in the PCE will detect external cosmic radiation, specifically energetic protons and heavy ions. Multichannel analysis will be performed on the magnitude of detected signals after appropriate amplification. Every five minutes the quantised data will be passed to the Packet Communications Experiment (PCE) to be stored for later transmission to Earth.

TOTAL DOSE EXPERIMENT

The PCE will measure the total ionising dose accumulated at various positions on and within the spacecraft during its orbital lifetime. The sensors used are 'RADFETs' which comprise specially designed MOSFETs. The RADFETs possess a thick gate oxide (>1000 Angstroms) which makes them sensitive to ionising radiation. Positive charges proportional to the ionising dose are trapped in the gate oxide and shift the threshold voltage of the RADFET pairs (one biased and the other unbiased) fabricated on the same die — producing a change in threshold voltage proportional to ionising dose and independent of temperature. Average dose rates, integrated over the orbit, of around 6 rads/day are expected inside the spacecraft in the UO-D/E orbit.

PAYLOADS

The UoSAT-E satellite will be based on an identical 'bus' as UoSAT-D, OBC, telemetry, telecommand, power generation and conditioning, and mechanical structure will remain the same. The complement of payloads and experiments, however, will change. UoSAT-E will be primarily a technology demonstration mission, flying the Transputer Data Processing Experiment (TDPE), Solar Cell Experiment (SCE) and CCD imaging system which were to fly on UoSAT-C.

ADVANCED SOLAR PANEL TECHNOLOGY

The UoSAT-E Solar Cell Experiment comprises an array of solar-cell samples from several manufacturers which will be constantly monitored for changes in performance caused by radiation temperature, and other environmental effects. The cells will represent the complete range of solar generator technologies under development: Gallium Arsenide, Indium Phosphide and Silicon. The cells will be covered by various overcoatings designed to enhance panel efficiency and/or reduce panel degradation due to radiation. The SCE will be mounted on a panel that will replace part of a solar panel on the side of the UoSAT-E spacecraft.

The SCE monitoring system will wait until the sun is directly upon the SCE, and then make a series of 100 current/voltage measurements on each cell sample. These data will be sent in bursts to the satellite's 1802 OBC, for storage prior to transmission later to ground.

In addition to the SCE, UoSAT-E will carry the first Gallium Arsenide solar arrays manufactured by FARGISE (Italy) and EFW/MSS/RAF (UK).

USAT-D/E UPDATE (Bulletin 153)

Over the last two weeks, engineering structure qualification and magnetometer calibration tests have taken place.

The engineering model spacecraft structure has been subjected to vibration tests at the Royal Aerospace Establishment, Farnborough, UK. Both random (20 grams) and sinusoidal tests have been performed in lateral, longitudinal and thrust axes. Also, two 1000 gram shock tests have been carried out. So far, no unexpected resonances in the structure have been found. The next test to be performed on the engineering structure is a further shock test.

Also, the engineering model navigation magnetometer has undergone preliminary tests at RAE, Farnborough. Preliminary results show that the instrument is performing well.
de Colin VK5HI

WICEN News

BIKE RIDES TOP OFF BUSY WICEN YEAR

The resources of the Wireless Institute Civil Emergency Network (WICEN) will be stretched to the limit when it provides safety and emergency communications for two bike rides.

The largest ride is the Australian Bicentennial Caltex Bike Ride which takes to the road for two weeks beginning in Melbourne on November 26, for a route through Gippsland and cover in excess of 1000 kilometres, linking Melbourne, Canberra and Sydney.

The other event is the Fifth Great Victorian Bike Ride organised by Bicycle Victoria, which travels from Swan Hill to Melbourne, from December 3 to 11.

WICEN's involvement in previous bike rides providing safety and emergency communications has won widespread praise from organisers and participating cyclists.

The radio amateurs who give their support to such events not only gain experience which could prove invaluable in times of a natural disaster, but they perform a worthwhile service.

At the same time give our hobby some good public relations. WICEN urgently needs radio amateurs for both rides. If you can arrange to join the entire route of a ride, then fine, but even a day along a route would be helpful.

Perhaps you could join the WICEN team as a ride passes through your area — but you need to make your availability known soon.

Meals are supplied along with a petrol allowance for the time you spend with a ride. WICEN would also like to hear from any radio amateur who could reliably monitor 3.600 MHz from midnight through to the early hours in case of an emergency.

If you can assist, or would like more information, the following WICEN contacts can help:
Colin VK3AKQ (03) 799 2081.
Denis VK3XP (03) 783 5400
Ian VK3FOX (03) 785 2976.
Steve VK2DNN (02) 860 4783.
Dana VK1DG (02) 31 3226.



NEW AMATEUR RADIO SPECIALIST

Chris Ayres VK2YUS has been appointed specialist product buyer in charge of amateur and related communications products at Dick Smith Electronics Head Office.

This new position recognises the new emphasis that Dick Smith Electronics is putting into hobbyist and enthusiast products. Managing Director Jeff Grever, said that in creating the specialist position to service the amateur radio market, the company had acted on the feedback it had received from customers.

"Many customers believed that we were getting out of amateur radio, or at least winding it down," Jeff said. "This is, of course, exactly the opposite of our intention. However, we needed someone who knew the amateur market intimately who could guide us in our decisions. Chris Ayres has that knowledge, is a very keen and active amateur and will be able to help Dick Smith Electronics once again become the leading supplier of amateur radio equipment in Australia."

Chris Ayres will be no stranger to amateurs or to current Dick Smith Electronics customers: prior to his promotion he was manager of the North Ryde store, and has managed several stores, and been amateur radio specialist in others, since joining the company some eight years ago.

Contributed by Adam Benedek, Dick Smith Electronics Pty Ltd



HAPPY BIRTHDAY

Amateur Radio's present printer Westernport Printing has just celebrated 90 years of service to the industry. During this period the business has undergone many name and ownership changes and four since commencing the printing of Amateur Radio, over a decade ago as Waverley Offset Printing Group, which was unfortunately demolished by fire.

The Managing Director, Mr Chris Fisher says that "the sales team are improving our customer service and are keen to develop the potential for growth with our major customers."

Every good wish to you personally, Chris and the staff at the Koo-Wee-Rup plant. Koo-Wee-Rup, is a quiet country town off the South Gippsland Highway being discovered and named Yallock c1847 by a surveyor. In c1890 it was changed to its present name. The name has many spelling variations nevertheless Australia Post prefer the Koo-wee-rup version which has an Australian Aboriginal meaning of "Blackfish". The area was originally a swamp which has been reclaimed by an extensive drainage system that flows in to Westernport Bay.

Contributed by Ken McIsaac VK3AH

When inquiring about products you have seen in AR, don't forget to mention where you learned of the product!



Awards

Ken Gott VK3AJU

WIA FEDERAL AWARDS MANAGER

38A Lansdowne Road, Saint Kilda, Vic 3183



NEW FEDERAL AWARDS MANAGER

Ken Hall VK5AKH, who has been WIA Federal Awards Manager since February 1986, has retired from the position and the Federal Executive expresses the thanks of WIA members to him for his services.

Ken's retirement as Federal Awards Manager coincides with his retirement from his church ministry and an impending change of QTH. However, Ken says he will continue to live in Adelaide and hopes to have more time to devote to his favourite amateur radio activity, CW on HF. Best wishes Ken in your two retirement.

Ken is succeeded by Ken Gott VK3AJU.

Ken obtained his call sign in 1983 and is an honour economics graduate of Melbourne University, who worked as a business writer, lecturer and analyst for many years in New York and Hong Kong. He returned to Australia in 1978 as international affairs analyst for a leading mining company, and now works as a freelance writer and consultant.

Ken's radio interests are DX and portable work, preferably combined. He was runner-up in the solo 24-hour section of the 1987 John Moyle Memorial Field Day Contest and winner in 1988.

He holds the WIA DXCC Award and the ARRL Golden Jubilee DXCC Award, as well as several awards from NZART. He also holds awards from all WIA Divisions, except VK2 (he says he is working on that). Ken insists however, that he is not a 'paper chaser'.

Ken is currently President of the Moorabbin and District Radio Club. His first Awards Column appears below.

— Bill Popper VK3ARZ

We all know that an award is one thing and a contest is something quite different. But have you ever considered turning an award into a contest?

The idea is that, when a new award is announced, you set out to win the first certificate, or as close as possible to Number 1.

My favourite example concerns Harold Hepburn VK3AFQ, and the VK3 National Parks Award.

The conditions for this award appeared in the December 1967 issue of AR. Briefly, it could be won by making QSOs from 15 National Parks in VK3. (There was also a parallel award for stay-at-homes who made 15 QSOs into National Parks).

Harold and Peter Downie VK3APD, decided to be the first winners. They spent a weekend working from some parks close to Melbourne (such as Ferntree Gully and Churchill) as a trial-run, and then prepared for two tours which would take them to the parks in eastern and western Victoria, in that order.

They assembled HF and VHF equipment, a generator, 40 foot mast, camping equipment and plenty of enthusiasm, all packed in Harold's station wagon.

The expedition was carefully planned and its schedule publicised via the VK3 weekly broadcast. Harold went on the broadcast personally and a telephone number was given from which details of the expedition could be obtained as it progressed.

Five days were allotted for eastern Victoria, with operation between 1400 and 1800 local time at each destination.

When the stations came on air, there was usually a pile-up awaiting them. Ah, there was enthusiasm in those days! The pair logged close to 400 QSOs during the trip.

Their camping equipment was never unpacked. At every stopover, Harold and Peter were besieged with offers of meals and accommodation. Ah, there was hospitality too, in those days!

Peter had to withdraw after the eastern Victorian tour, but Harold soldiered on to win Certificate No. 1. He would have been No. 1 anyway, since the arrangement was that at each stop he took the first hour of operations and Peter the second!

The certificate bears the signature of the late Keith Rogot VK3YQ/YUB-HP who served the WIA in many capacities, among them as VK3 President, Secretary and Treasurer. Keith combined a love of nature with amateur radio and was instrumental in establishing the National Parks Award. After his death in 1981, the award was renamed in his memory, and the certificate redesigned. Being in full colour, the new design does not lend itself to reproduction in these pages.

Other examples of an award becoming a contest, or at least a personal challenge, come to mind in connection with the Golden Jubilee DXCC Award of the ARRL announced in 1986. This was to mark the 50th Anniversary of the DXCC itself in 1987, and QSOs had to be made within that year. Unlike the "real" DXCC, cards were not required.

Jim Smith VK9NS, of the Heard Island DX Association and 14 220 MHz Net, offered a personal prize to the first amateur to win the award. The prize went to the tireless and ever-helpful Harry VK3ABO who completed his 100 countries by January 20, 1987.

The ARRL Golden Jubilee Certificates were not numbered, but despite Harry's great effort, he was days, if not weeks, behind some of the enthusiastic DXers in the USA.

I have played this game myself on a couple of occasions, the first being when the VK5 Division announced an award to mark the 150th Anniversary of South Australia.

This award, which had an opening date of January 1, 1986, was conceived with flair and imagination and I commend its rules to all who might be designing similar commemorative awards. (The rules are in AR October 1985).

WIRELESS INSTITUTE OF AUSTRALIA

ESTABLISHED 1926

NATIONAL PARKS
IN VICTORIA

- (1) ALBERT
- (2) ARTHUR
- (3) CARROLL
- (4) FERNETREE GULLY
- (5) GARDEN
- (6) GARDENHURST
- (7) GARDEN LANE
- (8) GARDEN
- (9) THE LANE
- (10) GARDEN
- (11) GARDEN
- (12) GARDEN
- (13) GARDEN
- (14) GARDEN
- (15) GARDEN
- (16) GARDEN
- (17) GARDEN
- (18) GARDEN
- (19) GARDEN
- (20) GARDEN

VICTORIAN NATIONAL PARKS AWARD

No award is issued by the Wireless Institute of Australia (WIA) unless the applicant has completed the form and has it signed by the holder of the award.

No award is issued by the Wireless Institute of Australia (WIA) unless the applicant has completed the form and has it signed by the holder of the award.

Awarded to

H. L. HEPBURN. VK3AFQ.

Date issued 15th March 1988

Certificate No. 1.

One could earn it by contacting 150 VK5 stations and there is nothing wrong with that. VK5s are splendid people, the salt of the earth, and wonderful to talk to. However, preparing a log extract of 150 QSOs can, at times, be a tedious task.

However, the VK5 Jubilee Award had some wonderful short cuts for getting the 150 points needed. There were great bonuses for contacting club stations, for QSOs on 1.8 MHz, 50 MHz and above, and on WARC bands.

At the moment, I cannot think of any other example of a VWA Division giving an incentive for use of the WARC bands. I estimated that one could maybe win the award with as few as 50 QSOs.

So, starting January 1, 1986, I made my run to be the first to win the certificate. When it duly arrived, it was numbered '0', which was not a bad result. However, I was very happy to see that it was endorsed "first to use WARC" (bands). That was really encouraging.

Later in 1986, there was another VK5 Sequentiary award to mark the first settlement on Kangaroo Island. This was timed to commence when the operating party arrived by ship at Cape Willoughby Lighthouse on the island. Having visited this historic light station, I was determined to win the first certificate for the "Kangaroo Island Cape Willoughby Lighthouse Jubilee Award", as it was called.

So, there I was, mic in hand, waiting for the opening minute to tell The operators were right on schedule and I fired away. Result: Certificate No 2 — again not so bad.

Certainly, if you want to play this game, you need information on the rules of forthcoming new awards ahead of their opening dates. That is a reason to keep reading this column in which I hope to be able to be the first with the latest on new awards and changes in the rules for old ones!

Returning to the VK3 National Parks Award introduced in 1968.

For more than 20 years this was the only award of its kind in Australia, which was surprising in view of the number and quality of our National Parks and the publicity they periodically receive.

However, VK2 has now introduced a National Parks and Historic Places Award to mark the Australian Bicentennial and you will find out more about it in the VK2 M-n-Bulletin, June 1986 AR, page 60.

In past years, VK3 amateurs have sometimes declared a weekend when they would activate as many National Parks as possible. This was often on the Moomba long weekend.

Now that VK2 has a similar award, it would be good if the two Divisions could get together in an effort to have an annual activation of their respective parks.

Those interested in these two awards should note, however, that the criteria for qualifying parks and nature reserves are different for the two States.

In VK3, only National Parks count towards the award, whereas in VK2 a variety of State parks, fauna and flora reserves and other types of parks are allowable.

In VK3, one of the original National Parks (the Organ Pipes) has lost that status since the award was introduced, and many others have been added to the list. A little like DXCC, isn't it, with its deleted countries and new countries? The last time a list of VK National Parks appeared in AR was in the February issue 1985, when there were 31.

At least one VK3 amateur has won his State's National Parks Award by visiting parks and accessing two metre repeaters from them.

What a wonderful way to spend a vacation! Maybe somebody in AR will prepare a similar travelogue for publication in AR, describing experiences on working from New South Wales parks and sites awards.



Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic 3199

Now that I have written December at the top of this article, it seems that the year is nearly at its end, although in reality I am writing in mid-October, and there is still a vast amount to be done before the new year.

Events in the education field of our hobby have moved more slowly than we were led to expect, and it appears unlikely at the time of writing, that the development arrangements will all be in place until well into 1989.

This may not be such a bad thing. I am sure that a little extra thinking time is of great value in such matters. When the first flush of enthusiasm has subsided, it is possible to be much more objective and realistic about the plans and ideas which were thrown around.

There are two possibilities. The original grand plans may gradually be reduced in scale as it becomes apparent that the proposers are expecting others to pick up the proposals and carry them out, or the problems assume a higher profile. Alternatively, the original idea can be developed, refined and extended to a more comprehensive and useful program as new participants are brought into consultation and possibilities are researched.

I have the feeling that the development plans developed by many groups are of the diminishing rather than the growing type. The thinking and planning was done in something of a rush when there was pressure for a response, and now that we are in a situation where we cannot proceed, there is a risk that the earlier enthusiasts will lose interest, and so many of the potential virtues of the proposals will be lost.

I hope I am wrong. But I do not want to see clubs or individuals lose sight of the long term aspects of becoming accredited examiners.

The examiners who operate on a 'once only' basis will be in the minority.

In most cases, I hope, the aim will be to run at least one examination per year, or have a regular

program which can be advertised in advance so that outsiders can be directed into it. This system will call for a degree of continuity in several aspects.

It is probably unrealistic to expect complete continuity of personnel, but every effort should be made to avoid sudden and complete changes — the examiner should ensure that there is an 'understanding' who is familiar with all the processes and requirements and is prepared to move into the appointment in due course.

Continuity of recording is, of course, essential, both because of Departmental requirements and for the benefit of the candidates. And I would hope that the selection of questions for each paper would be carried out with due consideration being given to the questions used in previous or concurrent papers. Even if the random generating program is used, there will still be a need for this sort of overview, so that a balance is maintained both within and between papers.

I know that a few groups are working steadily towards becoming efficient and effective examining bodies. I wish them well, and hope to be kept informed of their progress. I would be very interested to hear of the "state of play" in other groups, the problems being encountered or overcome and suggestions of the kinds of assistance which may be needed or offered to make the various programs work well.

As I have said before, I am sure there is much room for sharing of ideas, resources and workloads between the examining bodies. This will not only reduce the pressure on everyone, but will also help to ensure an even standard throughout the country.

My best wishes for the Festive Season and New Year to all our readers. May 1989 be a year of co-operation, harmony and healthy growth for the Institute and for our hobby in general.



Magazine Review

Roy Hartkopf VK3AOH

34 Toolangi Road, Alphington, Vic. 3087

- G — General
- C — Constructional
- P — Practical without details constructions information
- T — Theoretical
- RE — Of particular interest to the novice
- X — Computer program

HAM RADIO, August 1988. 4800 Band Modem (P). Hundred Years of Electric Waves (G). Impedance Matching (T N). Regulated High Voltage Power Supply (P). Propagation Basics (G N).

QST, August 1988. Antenna Special Issue. Coaxial Mast (P). Portable Antennas (G).

BREAK IN, August 1988. ATV Issue. Audio Modulator for ATV (P). Simple Video Signal Generator (P).

QST, August 1988. Two Metre Linear Amplifier (C). Versatile Timer/Controller (C). Integrating Squelch Circuit (C). Elevated Vertical Antenna Systems (T P).

RADIO COMMUNICATION, August 1988. New Amateur Radio Licence (G). VHF/UHF Beam Antenna (P). CW Fitter (P). National VHF Convention (G).

QST, July 1988. Talking Wattmeter (C). Simple Tuning Indicator (C). RF-I and VCRs (P N).

73 MAGAZINE, July 1988. Licensing and Novice Issue.

VHF COMMUNICATIONS, 1/1988. SMD Technology on 1296 MHz (C). 70 cm Converter (P). Wideband Power Divider/Combiner (C). 12V/12V Regulated Converter (P). Index to Volume 19.



YLRL AWARDS

This year (1988) is the 50th Anniversary of the YLRL, and it might be an appropriate time to have a look at some of the awards offered by that organisation.

YLRL 50TH ANNIVERSARY AWARD

Details of this award were published in November *Amateur Radio*.

YL CENTURY CLUB (YLCC)

Two-way communications must be established on authorised amateur bands with stations, mobile or fixed, operated by 100 different licensed women amateurs. Any and all amateur bands may be used.

All contacts must be made from the same country.

Contacts may be made over any period of years provided only that all contacts are from the same country.

The YLRL YL-DXCC Certificate Custodian, with the approval of the YLRL President and Vice-President in charge of contest and certificates, may designate a YLRL member as a sub-custodian in DX countries to check QSL cards of an applicant for the YL-DXCC Certificate or sticker and confirm the list of contacts to the certificate custodian in the USA.

ENDORSEMENTS. After receiving the certificate, a 5-vr sticker will be awarded for contacts with YLs in 25 additional countries. Same list and postage requirements as in the original application.

Contacts with YLs anywhere in the world are recognised provided only that confirmations clearly indicate the stations were operated by duly licensed women amateur radio operators.

Application must be accompanied by 100 QSL cards or photocopies of both sides of each QSL card used to confirm contacts for the application.

or other written communications from the station worked confirming the necessary two-way contacts. The application must be accompanied by a list of claimed contacts, including the full name of the operator, alphabetically arranged by last name, the call letters and the date of each contact.

Sufficient postage must be sent with the confirmations to finance return by First Class mail, plus sufficient postage to mail the certificate. YLRL will not be responsible for any loss or damage to confirmations.

WORKED AL STATES — YL

The WAS-YL Certificate is available to all amateurs, US or foreign. Contacts must be made with a duly licensed YL in each of the 50 United States. The District of Columbia may be counted for Maryland. No time or band limitations.

Contacts must be made from the same country. The call used is immaterial, provided it is licensed to the applicant.

Applications must be accompanied by QSL cards or photocopies of both sides of each QSL card used to confirm contacts for the application or other written communications from the stations worked, confirming the necessary two-way contact.

The application must be accompanied by an alphabetical-by-State list, showing call of station worked, date, band, mode, RST and YL's first name.

Sufficient postage must be sent with the confirmations to finance their return by First Class mail, plus sufficient postage to mail the certificate.

WORKED ALL CONTINENTS — YL

The WAC-YL Certificate is available to any licensed amateur in the world.

Two-way communications must be established on the amateur radio bands with the six continents North America, South America, Europe, Africa, Asia and Oceania. Any and all authorised amateur radio bands may be used. Contacts may have been made over any period of time.

Contacts with all six continents must be made from the same country. The call used is immaterial provided it is licensed to the applicant.

Application must be accompanied by six QSL cards or photocopies of both sides of each QSL card to confirm contacts for the application, or other written communication from the station worked confirming the necessary two-way contact. A list of contacts must accompany the cards.

Sufficient postage or IRCs must be sent with the confirmations to finance their return by First Class mail, plus sufficient postage to mail the certificate. YLRL will not be responsible for any loss or damage to confirmations.

YL — DXCC CERTIFICATE

Two-way communications must be established on authorised amateur bands with stations, fixed or mobile, operated by licensed YLs from 100 countries on the current ARRL list of countries.

All contacts must be made from the same country.

Any band or mode (except cross-band contacts) may be used.

Applications must be accompanied by QSL cards or photocopies of both sides of each QSL card to confirm contacts for the application. The application must be accompanied by a list in alphabetical order by countries of call, name, band and mode.

Sufficient postage or IRCs must be sent with the confirmations to finance their return by First Class mail, plus sufficient postage to mail the certificate.

YLRL will not be responsible for any loss or damage to confirmations.

DX-YL CERTIFICATE

This is available to licensed YL operators only, for working 25 other licensed women operators outside your own country on or after April 1 1958. USA and possessions are counted as separate countries, as well as Alaska and Hawaii. Any and all amateur bands may be used.

Contacts do not have to be with 25 countries, just 25 DX YLs.

All contacts must be made from the same country. The call used is immaterial provided it is licensed to the applicant.

QSL cards must be in your possession, but do not send them to the DX-YL Custodian. Another amateur must sign the log, verifying that the QSL cards are in the possession of the applicant.

Send copy of log to the DX-YL Custodian. Log must show date, time, station worked, frequency, her report, your reports, mode, her name and her QTH.

ENDORSEMENTS Stickers will be awarded for each 10 additional DX-YLs, subject to the same confirmation as above.

No charge is made for the certificate but sufficient postage for First Class mail must accompany the application to cover the cost of mailing the certificate.

NOTE For all YLRL sponsored certificates which require the submission of QSL cards to confirm the claimed QSOs, a verified log may be submitted in lieu of QSL cards and a list of QSOs. The log must be in the same order as that required and a list is sent instead. The log must contain the following:

name, call sign, QTH, date, time, RST and band and mode of contact. YLRL will accept as satisfactory proof of confirmed QSOs, and that the QSOs are on hand as claimed by the applicant if the log is signed by (a) a radio club officer, OR (b) two YL licensed amateur radio operators. If this method of confirming contacts is used, sufficient postage to cover the cost of mailing the earned certificate to the applicant must be included with the verified log.

BASIC RULES APPLICABLE TO ALL YLRL CERTIFICATES

1. Contacts made through repeater devices or any other power relay method cannot be used for any YLRL Certificate confirmation.
2. Decisions of the custodians regarding interpretations of the rules as here stated or later amended shall be final.
3. All inquiries regarding cards, applications, or the certificates should be addressed to the appropriate custodian.

(Names and addresses of current custodians for these certificates may be obtained from VK2EBX. Please enclose a SASE.)

ALARA CONTEST

The ALARA Contest was held on Saturday, November 12, 1988. Details in a future column.

Just a reminder to post your logs to the Contest Manager, Marlene VK3JAW, by December 31 1988.

Australian YL novices entering for the Florence McKenzie CW Trophy should indicate their CW score separately.

Logs must show date, time (UTC), band, mode, call sign worked, report and serial number sent, report and serial number received, name of operator of station worked and points claimed.



Anne Hood GM4UXX, and her 20-hour old niece, Natalie Frances.

They must also show full name, call sign and address of the operator and final score (points claimed) and must be signed. Logs must be legible, no carbon copies. No logs will be returned.

Please check your log before submitting to the Contest Manager to ensure that it complies with the above regulations and avoid disappointment.

BITS AND PIECES

Elizabeth VF7YL, was operating an interesting call sign G77YL, on the 222 YL Net, on October 3. It was, apparently, for Canadian International Development Day.

Lynn DU1AUJ, runs an Asian YL Net on Sundays, at 0700 UTC, on 21 288 MHz. All YLs welcome.

VK3BSM came on the 80 metre ALARA Net on October 3, hoping some of the members could talk to the Gurdies in attendance. Unfortunately, not many of the stations on frequency could hear them well enough for a QSO, but one or two managed it and gave the girls an insight into amateur radio, and a chance to get in a little practice for GITA. VK3 members of ALARA operated the call sign V68VIC on late September making a total of 770 contacts. Not a bad effort!

Several JLRs "YL88" Awards have already been received at the time of writing, together with an attractive souvenir JLR scarf. A nice gesture by the Japanese sides.

That's all for this month and this year. Wishing everyone the joys of the Festive Season and see you again in 1989.

73/33, Joy VK2EBX

Solution to Morseword 22

Across 1 stab 2 heel 3 vac 4 sins 5 they 6 odes 7 earl 8 arena 9 g ft 10 dims
Down 1 spat 2 sup 3 sews 4 kind 5 hide 6 twist 7 talk 8 lie 9 ices 10 saute

	1	2	3	4	5	6	7	8	9	10
1
2
3
4
5
6
7
8
9
10



Spotlight on SWLing

Robin Harwood VK7RH

52 Connaught Crescent, West Laverston, Tas. 7250

The Bicentennial Year of 1988 is rapidly drawing to a close as we look back over the past 12 months. One notable fact has been that HF propagation has dramatically improved as the solar flux has climbed higher. The ionospheric experts are now tipping that the maxima will arrive as early as this year, possibly September or October. I am getting signals from Europe on 21 MHz as early as 0700 UTC about now, but it is very interesting to observe it that is Long Path propagation.

Propagation on the lower frequencies did not seem to me as dramatic as in the previous 12 months. I also note that the QRN levels have also escalated and that one has to go much higher in frequency to escape it. Fortunately, there are plenty of interesting and odd signals to what the apex.

This year has seen some changes in both style and presentation to Radio Moscow. It certainly has brought an increase to their audience in the Western Countries. This, indeed, is a reflection of the domestic changes within Soviet life during 1988. It is a pity that other socialist states haven't also revamped their programming, yet they are presumably nervous themselves about recent changes in the Soviet Union.

We also saw the demise of a well-known broadcaster on shortwave, when the US Armed Forces' Radio and Television Service, closed down their HF operations at the end of September. As reported in October AR, all AFRTS programming is to be routed via satellite feed to maritime vessels. The closure of the HF facility has upset many listeners throughout the world, in particular, expatriate Americans who have relied on AFRTS to keep them abreast of domestic news. The Voice of America (VOA) is not designed for American audiences, for its charter is to broadcast to non-American audiences. The VOA is a part of the US Administration and generally reflects its views, although the news is supposed to be independent and unbiased. AFRTS has mainly relayed domestic network news and sports minus the commercials, which has also been a boon to American listeners.

This year has also seen increasing use made by international broadcasters of sharing each others' senders, to reach their target areas. This year saw the Spanish and Chinese begin sharing time over each others' senders, closely followed by the Japanese and French, the Canadian and

Japanese, as well as the VOA and Deutsche Welle. Another trend is for some broadcasters to ease transmitter time from Radio Bras in Brasilia, the BBC, Swiss Radio International and Deutsche Welle. This trend is to be welcomed instead of building super-powered senders which in turn pollute the frequencies for more modest powered senders.

Many nations are very loath of entering into time-sharing arrangements because they do not wish to compromise their neutrality or territorial sovereignty. Sweden, for instance, would benefit by having such an arrangement! Yet the government will not countenance it as it jealously guards its neutrality.

Yet another welcome trend is that the level of jamming has decreased, although broadcasts from Radio Free Europe/Radio Liberty to the USSR and eastern Europe, are still heavily jammed. Another jammer that recently went silent, a Iraqi "Klaxon" sound. The eight year long Gulf War came to an end in the middle of the year. A number of anti-Iranian clandestines also slowly disappeared. And, talking of clandestine operations, the emergence of a Palestinian clandestine station on 7440 MHz, presumably within Syria, was noted. The Middle East and Latin America will continue to be areas of clandestine broadcasting operations.

The trend towards utilizing data modes on HF, especially packet, has been obvious. We have all witnessed recent correspondence within the pages of this magazine of late. It is to be expected that the data activity will increase, as more information can be rapidly processed compared to aural means. Unfortunately, data does suffer from propagational disturbances, necessitating numerous repeat feeds. Data systems are likely to proliferate, particularly on VHF/UHF.

Keep listening on frequencies above 20 MHz over the next 12 months. Already more stations have woken up to the 11 metre broadcasting allocation (25.600 to 26.100 MHz). The BBC has been using 25.750 MHz, from Davenport to Asia from 1100 UTC. Paris is on 25.820 MHz. Others will follow rapidly in the next six months.

Well, it only remains for me to wish you all Seasons Greetings and may 1989 be a safe and peaceful year for you and yours!

73 de VK7RH



Intruder Watch

Bill Martin VK2COP

FEDERAL INTRUDER WATCH CO-ORDINATOR

33 Somerville Road, Horsham Heights, NSW 2077

Well, it is time to present my final column. My first was in AR, October 1982, and we have seen a few changes since then in the hobby. As my resignation from the position of Federal Intruder Watch Co-ordinator was to be effective on my replacement being found, or the end of the year, it appears that it will become effective on December 31, 1988. My very best thanks to all those who have been supporting the IW over the years, and particularly while I was in office. I am, of course, still Monitoring System Co-ordinator for IARU Region 3, so am still involved in trying to chase the nuisances off our bands.

I regret that I cannot supply the name of the next Federal Co-ordinator, as no one has come forward and offered their services. However, I am sure that somebody will, sooner or later. Please give him/her and your Divisional IW co-ordinator some assistance in reporting intrusions into the amateur bands.

I have just initiated inquiries in Japan regarding the nuisance caused by Japanese fishing boats,

especially on the 80 metre band. The JARL Intruder Watch co-ordinator is making inquiries on our behalf, and I have asked him to try to publicise the problem in Japan with a view to a possible reduction of the problem.

The VK2BWI Slow Morse sessions, in particular suffer harmful interference from this source. At the time of writing all reports are not in for September, so statistics are unavailable for that month. The deadline must be obeyed! Reports received so far are from VK4NGF, VK5GZ, VK5TL, VK6RO, VK6HA, VK8JF.

All the very best wishes for the Christmas and New Year Season to everyone, and I hope that 1989 sees a reduction in the number of intruders who make such a nuisance of themselves. I won't see you in the magazine again, but look for me on the air. Goodbye and good luck.

Bill VK2COP



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This conference was sponsored by the Mt. Airy VHF Radio Club Oct 10-11 1987. 11 papers cover everything from mountain toping to VHF/UHF for 3400 and 3600 MHz bands. 120 pages Stock #BX175 \$20.00

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How's DX?

MACQUARIE ISLAND

John VK2DEJ, will act as QSL Manager for Robyn VK0AE, during her stay on Macquarie Island in 1989

Address QSLs to John Saunders VK2DEJ, 8 Toni Crescent, Ryde, NSW 2112

HEARD AND WORKED ON 20 METRES at Woodbine, NSW

3/9/88 - Worked W00KC, 389FR (QSL F6FNU), heard A4XKB (QSL N4GNR) between 1254-1322

4/9/88 - Worked I1WFF, G3XEP/R, OZBERA/R, G4SJM/R, G4SDP/R, FE6DZ (QSL F6GV5), G3WAS/R, LSOF (QSL LU1FT), ON5CM, G4HRS/R, E17M/R between 0545-0722

10/9/88 - Worked SM3PZG, G4WDX, VK6HQ, WA4AFE between 0652-1017

11/9/88 - Worked OH2BH, YT3AA, 6K2450* between 0709-0948 UTC.

14/9/88 - Heard VR6ID (QSL KB6ISL) at 0913 UTC

17/9/88 - 0917 worked HL8SOYC, special station for Olympics. QSL HL2S direct. Heard FR5V5 at 1256 (QSL F8FNU).

18/9/88 - Worked A35SA (QSL KB7QC) WA2IUQ, HA8KQX KC2Q**

W3AE between 0455 and 0937

24/9/88 - Heard 5W1HG at 0912, QSL via N5CX.

25/9/88 - Between 0923 and 1016 worked OX3SG, OY9JD, W4/G4MZF (QSL NK4U), OH2PM and OH2BH

* This station was located in the Olympic Village, Seoul. QSL to the Korean ARL

** A special station located on the site of Marconi's first commercial electricity station. QSL to OMARC, PO Box 357, Bradley Beach, NJ 07720

Send QSL plus one IRC

—Contributed by Bob Demkow AX2ENU



Charlie VK6MP will shortly be heard from Casey Base — see page 36 November AR.

Club Corner

CENTRAL COAST AMATEUR RADIO CLUB INC GOSFORD FIELD DAY 1989 Preview

All amateur radio operators, their families, friends and those interested in amateur radio, are invited to attend the 1989 Gosford Field Day to be held on Sunday, February 19, 1989, at the Gosford Showground. Gates will open at 8 am, wet or dry, as all displays are under cover.

REGISTRATION: Gents — \$5, Ladies and Pensioners — \$3, Children — \$2. A special group concession will also be available on application.

PROPOSED PROGRAM

- | | |
|-------------|---|
| 0730 - 0830 | Open Mobile Scramble |
| 0800 - 1300 | Registration |
| 0800 - 1700 | Tea and Coffee available in Dining Room (no charge) |
| 0830 | Disposals booking-in closes (Dwyer Pavilion) |
| 0945 | Marshal outside Agricultural Pavilion for the 1000 hours Pedestrian Talk-In Fox Hunt — two metres FM (146.500 MHz) |
| 1000 | Disposals open (Entry southern and of Dwyer Pavilion) |
| 1030 | Quick sheets available at Nametags. Return to Nametags before 1330 |
| 1100 | Ladies Events |
| 1100 | Entries close for Home Brew Contest in Dog Kennel Building |
| 1100 | Marshal outside Agricultural Pavilion for the 1115 hours Pedestrian Talk-In Fox Hunt — two metres FM (146.500 MHz) |
| 1130 - 1230 | Lucky Registration Number Drawing — see drawings |
| 1215 | Drawing of raffle check for information for winners |
| 1215 | Home Brew Antenna Evaluation Contest (Agricultural Pavilion) |
| 1230 | Bus tour departs |
| 1245 | Marshal outside Agricultural Pavilion for the 1300 hours Long Pedestrian Talk-In Fox Hunt — two metres FM (146.500 MHz) |
| 1300 - 1530 | Packet Seminar (in Restaurant) |
| 1530 | Prize Presentation. Advise information if leaving early to arrange delivery of prizes. |

Field Day attractions include: Home Brew Contest, Home Brew Antennas Evaluation Contest (70 centimetres), Lucky Door Prizes, Disposals, QSL Bureau, Trade Displays, Amateur Television Display, Packet Radio Display, Ladies Stall, Complimentary tickets for bus tour and Reptile Park.

Novelty Events include

Ladies events. Ladies and Gents quizzes, youngest amateur, oldest amateur, longest licensed amateur, longest distance travelled.

Trains from Sydney and Newcastle will be met by a courtesy service which will run between Gosford Railway Station and the Showground between 8.30 and 10.30 am. There is plenty of off-street parking available at the Showground.

Accommodation is usually scarce on the Central Coast at Field Day time, so early booking is advised.

Tea, coffee and biscuits will be available from 8 am to 5 pm at no charge in the Dining Room. Take-away food can also be purchased in the Showground.

Companies, persons, groups, or clubs wishing to set up a table or display at the Field Day should contact the Central Coast Amateur Radio Club Inc at PO Box 252, Gosford, NSW 2250, before January 31.

Bring your QSL cards for the "Call Present" Board.

An Open Scramble will be held from 7.30 to 9.30 am. Rules are as follows:

1. No operation in Showground or one kilometre radius.
2. No operation on Gosford repeaters.
3. Log extract to the Event Recorder before 10 am to show time of contact, station worked, mode of operation, band, full serial numbers.
4. Incomplete or late logs are not eligible.
5. You may re-work the same station on several bands.
6. Scoring one point per station per band regardless of mode.

For the Home Brewing Antenna Contest, entries will be divided into two categories — beam antennas using horizontal polarisation on 432.400 MHz and omni-directional vertical antennas for 436 MHz. Entries must have mounting hardware to suit a 25 to 50 millimetre mast.

Entries for the Home Brew Contest are to be entered by 11 am in the Dog Kennel Building. Prizes for Open and Junior constructors. Judging will be in two categories. Kits and published designs.

Disposals forms and lot numbers can be obtained in advance from Reg Brook VK2AI, PO Box 252, Gosford, NSW 2250, or phone (043) 23 1662. Forms and lot numbers will also be available at the Showground on Saturday afternoon, February 19, 1989. All items for disposals must be booked in before 9.30 am on Sunday. Late arrivals or equipment improperly tagged or catalogued may be refused.

For further information about the Field Day write to the Gosford Field Day Committee, PO Box 252, Gosford, NSW 2250.

—Contributed by Les Watford VK2CLP Gosford Field Day Committee

TABLELAND RADIO AND ELECTRONIC CLUB

A new club was recently formed on the Atherton Tablelands, North Queensland.

The Tableland Radio and Electronic Club caters for amateur and citizens band radio enthusiasts, also computer and electronic hobbyists.

The club will apply for affiliation with the Wireless Institute of Australia. Meetings are held on the first Thursday of the month at the Atherton SES building. A club on-air net is held every Sunday on 3.550 MHz, SSB at 0830.

Interested persons are invited to join the club and share their knowledge with others. Electronic and computer workshops will be held as the club progresses.

The club will also be operating the Tablelands Repeater, located at Longlands Gap, near Herberton, transmitting on 146.675 MHz, with a -600 kHz split. Other repeaters and beacons are planned in the near future.

For further information contact:

The President — Will Booth VK4ZNZ, phone 95 3888, or
Vice-President — Bill Jesop VK4FET, phone 96 2124, or
Secretary/Treasurer — Dale McCarthy VK4KDM, phone 91 1446, or
Write to — TREC, PO Box 720, Atherton, Qld.

—Contributed by Dale McCarthy VK4KDM, Secretary/Treasurer, Tableland Radio and Electronic Club

ROYAL AUSTRALIAN AIR FORCE ASSOCIATION

Ex-Service personnel are reminded that the RAAF

Association was formed nearly 70 years ago, just after World War I, so that ex-fliers could get together socially and assist each other when the need arose. The Association has survived and grown until today, when its aims are more varied.

Nowadays, it aims to foster friendship and ideals of service life, provide welfare for members maintain a vigilant interest in civil and defence flying and relevant government policies.

Anyone who has served 30 months in Her Majesty's or Allied Air Forces or Services (Army or Navy) are eligible to join the association. Application forms are available from the Secretary at the Air Forces Memorial Centre, 4 Cromwell Road, South Yarra, Vic. phone (03) 240 8573. More members are always needed to carry out the above aims.

The Association has recently joined a government scheme to provide a weekly club session for retired ex-service men and women, and their friends. The club meets in Victoria each Wednesday at 1000 hours at the above Memorial Centre for an interesting program including morning tea and a light lunch. Each program has a speaker, and 52 speakers a year is quite a lot of people to find. If any readers, ex-service or not, can hold the interest of an audience for an hour, and you would like to donate your services as a speaker, please contact the President, Mrs End Base on phone (03) 572 1588.

—Contributed by Betty Cooper, member of the RAAF Association

CENTRAL HIGHLANDS AMATEUR RADIO CLUB

On August 13, 1988, the Central Highlands Amateur Radio Club relocated their second repeater to its new site on Hodeson Peak about 35 kilometres west of Daryn, Queensland.

The club, whose members comprise amateurs from the Central Highland towns of Midsqumun, Moranbah, Clermont, Tien, Glenden, Emerald, Daryn, Rubyvale, Blackwater, Capella and Springsure, has only been formed since December 1986, and now has a two metre repeater (VK4RRR) and 70 centimetre repeater (VK4RRH) linked together to cover the central highland area.

The club believes this may be a first for Queensland, if not Australia.

The Hodeson Peak exercise proved to be quite a day for those members who took part in the actual installation, which took about 12 months planning with field trip both on the ground and in the air to find the best possible access to the location. Nearby Browns Peak was also looked at but was unsuitable due to the extremely difficult access by foot.

Due to the rough terrain, Oak Creek Coal was approached for assistance with their Bell Jet Ranger helicopter to locate the pre-fabricated equipment on the peak.

The repeater parts were made up in different teams so all planning and measurements had to be done "on-the-air".

The tower section came from the Middlemount Scout/Guide group, the brackets for the antennas and solar cell were made in Clermont by Mal Lees VK4FPL and Les Dixon of the local SES group with the repeater itself being assembled by Repeater Officer, Richie Chappel VK4RR, n Moranbah. The repeater housing was made in Middlemount by Club President, Peter Sampson VK4MKT, and an old overworked drinks fridge was also obtained there, to house the battery and spare sundry items, eg 20 litres of distilled water.

The day began early, with Peter VK4MKT, leaving Middlemount at about 0601 and Richie VK4RR, leaving Moranbah at about 0603. Another group leaving Emerald at about the same time were Geoff Bonney VK4GJ and Geoff Hosking VK4ZGH, with their wives Audrey and Dianne. On the way Peter called into his work QTH, the German Creek Coal Mine, to pick up the drag line



Peter VK4MKT, guiding the tower down from the helicopter.



Geoff VK4GI, Leo Smart, Peter VK4MKT, Richie VK4RR, moving a refrigerator out of the way after the first helicopter drop.



(From left) Richie Chappel VK4RR, Peter Sampson VK4MKT, atop Hodson Peak with Lords Table Mountain in the background.



Oakley Creek helicopter with the first load onto Hodson Peak.



VK4 Repeater Highland Radio Finished. There is a pole on top of the tower to act as a lightning arrester, 70 centimetre antenna, two metre link folded dipole, solar panel, repeater housing and an old refrigerator for the battery.

operator and pilot, Leo Smart. Leo is not an amateur but was to help out with communications with the helicopter pilot on his aviation hand-held.

The group met at the base of Hodson Peak at about 0745 hours with some members actually meeting for the first time. Hoping everything would fit, the equipment was given a final check before the ground party left for the summit, as it was not known whether the helicopter would be able to land. Wind conditions on the morning were very strong. Geoff VK4ZGH, also a pilot, decided to stay at the bottom to load the equipment on to the helicopter when it arrived. The rest of the group started out for the summit 780 metres (2560 feet) above sea level at about 0830 hours. The climb to the top takes at least an hour and a half and the helicopter was due at 1000 hours!

Geoff VK4GI, took his video camera up the peak so he could tape the actual repeater installation. This was a mighty fine effort by Geoff to carry the heavy equipment up the mountain.

The helicopter, piloted by Oakley Creek Coal pilot, John Cooper, and relief pilot, Buck Ryan, arrived just after 1015 and flew over to check the site. The communications between us and the helicopter were co-ordinated by Leo with his hand-held radio at the bottom of Hodson Peak.

On the first run, a chain saw and fuel were lowered to clear a couple of trees on the approach and side areas at the top. Peter VK4MKT, then had some quick lessons in tree-felling. The drop area on the ridge was only about four metres (12 feet) across and, after the trees were cleared, 20 metres (60 feet) long.

The lifts were done by cargo net and slings. First to come up was the fridge and corrugated iron, followed by the tower, with the housing and battery last. The helicopter touched down on the top on full hover to pick up the nets and slings after each drop which took some very skilful piloting due to the



Peter VK4MKT, unloads equipment from the helicopter which is precariously balanced on top of Hodson Peak.

high winds coming up the cliff face. The brackets and antennas arrived inside the helicopter. Peter VK4MKT received a bit of a fright while unloading these as the helicopter had to lift off a little due to the high winds but re-settled to allow Peter to finish getting the equipment out and the net, etc in.

On the last trip, Geoff VK4ZGH, was brought up in the helicopter to assist with the rest of the task. A minor mishap occurred when the housing was blown over the side of the mountain by the helicopter downdraft. Leo and Geoff VK4ZGH, went down to try to retrieve it. About an hour or so later, two very tired fellows arrived back rolling the housing up the hill. Amazingly it required only minor panel beating, especially considering it must have fallen about 300 metres (1000 feet).

The rest of the installation went to plan, and the repeater was finished and tested by Richie at about 1700. The trip down the mountain was certainly much easier than the one up.

On behalf of all members of the Central Highlands Amateur Radio Club, the club would sincerely like to thank the following for their assistance in getting these repeaters operational for the benefit of amateurs and the community within the region.

The Blair Athol Coal Company, for their generous grant to the club, Oaky Creek Coal for the use of their helicopter and Messrs John Cooper and Buck Ryan, for their expert piloting, Mr Bruce Templeton for the use of his land and the assistance given during field trips, Capricorn Coal Management for equipment and assistance, the Midlemount Scout/Guide Group for the tower section, Watercom Communications of Mackay for their continued assistance and equipment and the Clermont SES Group for the use of their Drummond Range UHF CB repeater site whilst VK4RHR was being tested.

The CHARC is offering copies of their video taken by Geoff VK4GI to clubs for use on ATV or

meeting nights. The copies can be obtained by writing to Geoff, but a blank two or three hour tape in a padded post bag with return self-addressed label and postage must be included. His address is, Geoff Bonney, PO Box 582, Emerald, Qld 4720.

Club Repeater Officer, Richie VK4RR, has supplied the following technical information on the Central Highlands repeaters.

BLUE MOUNTAIN REPEATER

First under test January 31, 1987.

Location: 30 kilometres south-west of Sarina.

Call sign: VK4RRR
Height: 1070 metres (3500 feet).
Transmitting: 146.975 MHz.
Receiving: 146.375 MHz.
Power: 25 watts.
Time out: four minutes.
Equipment: Philips 828 Mk2, identification and control housed in same case.

Filter: RFS CP145-432N, insertion loss 2.75 dB.

Attenuation: 100 dB.
Feedline: 30 metres (100

HODSON RANGE REPEATER

Installation August 12, 1988. Original test site Drummond Range, 26 kilometres west of Clermont, September 1987.

40 kilometres east of Clermont
VK4RHR
780 metres (2560 feet)

436.500 MHz
433.500 MHz
25 watts.
four minutes

Philips 828 V Mk2
identification and control housed in same case

6LD-450S insert loss .95 dB on transmit and 1 dB
85 dB

feet) LDF4-50A Hellax

Antenna: RFI 6 dB
Collinear at 24 metres.

Solar power: 42 watt panel 200 AH battery.

six metres (20 feet) RG-213.

6 dB Collinear at five metres

Two 42 watt panels with Reg 200 AH battery.

LINK TRANSCEIVER
Equipment: Philips 828 Mk2
Call sign: VK4RHR
Transmitting: 146.375 MHz
Receiving: 146.975 MHz
Power: four watts.
Time out: four minutes.
Antenna: Dipole at three metres.

Linking distance between Hodson and Blue Mountain is 150 kilometres.

Richie reports the main reason for using 70 centimetres is to get away from TVI problems associated with Channel 5A in Moranbah and Capella ABC Television Channel 4 Mackay is received in Moranbah via Channel 4 receive Channel 0 transmit. Nabco, Channel 0 receive Channel 5A transmit. Copperbella. On the two metre band I have received FM broadcast radio and six metre amateur station being relayed via Channel 0 5A transactor 100 mW on 146.375 MHz interferes with my own television.

Another two metre repeater will be operating shortly from Hodson Range and will be linked into the above system.

Mobile contacts so far have been from Proserpine to Marlborough on the coast, and south-west to Emerald.

—Contributed by Peter Sampey VK4MKT President, Central Highlands Amateur Radio Club



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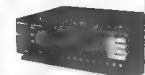
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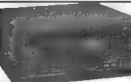
KENWOOD RZ1



ICOM IC 735



ICOM IC-761



KENWOOD R5000



ICOM IC R7000



ICOM IC-02

ICOM IC-04



ICOM IC-770

QSLs from the WIA Collection



Radio **VK2HV**

Thank you for Ur QSO

on 18 Sept. 1938 at

23.30 onwards E.A.S.T. Perth

Ur 40m Jone Sigs Hr

QSA 5 R.P. during

All Station Rec.

Dec. 9th 1938

Walter

VK4KC

This interesting pre-World War II QSL bears the rather rare prefix VK4 — for Papua. In the early 1930s the only VK prefix was for Australia which country had been allocated the prefix bracket of VHA-VMZ. In 1936, we find the first listing of VK9, not for the present nation of Papua-New Guinea, but for the Territory of New Guinea. Before World War II, Papua and New Guinea each had a separate public service and were treated independently in their administration.

It was John Moresby of Great Britain, who surveyed the south-eastern coast of the island in the 1870s, and by 1884 it was annexed for Britain. This relatively small part of the New Guinea island

mass was formerly called British New Guinea, but under the Papua Act of 1905, it became known as the Territory of Papua, Australia administering it from 1906. The remaining territory of the island, called New Guinea, became a mandated territory in 1920.

Both Spanish and Portuguese navigators had been active in the area in the early 1850s. It was the Portuguese explorer, Don Jorge de Meneses who gave Papua its name. This was said to be from a Malaysian name for "fizzy hair". The large territory of New Guinea was named in the mid 1850s by the Spaniard, Ortiz de Retez, apparently because of the resemblance of the native inhabitants to those he had seen on the African Guinea coast.

It was not until January 1937, that we find Papua listed as a country in QST. Mention is made of this magazine for it was in this same edition that the first "Official List" of countries was given. This was to become, in effect, the start of the present DXCC listings, although the ARRL Communications Department did not announce an actual DX award in QST until September 1937. The prefix for Papua was given as VK4, that of the Territory of New Guinea as VK9. Incidentally, one notes from Walter Bock's QSL card that at the time of this QSL (September 1938), the Australian mainland prefixes were limited to VK2 - VK7.

VK9DJ

This much more modern QSL card from Papua (dated July 1966) shows the territory of Papua in relation to New Guinea and West Irian. The large island of New Britain to the north is also part of New Guinea. The VK4 prefix for Papua continued to be used (along with VK9 for New Guinea) until 1948, when the prefix change to VK9 was made.

Much of Papua is thick tropical forest along with towering mountain ranges. The coastal city of Port Moresby (named after the surveyor of the area) was then the capital of Papua. After the two territories of New Guinea and Papua were brought together administratively by the Papua-New Guinea Act of 1949, Port Moresby became the capital and administrative centre of the combined territory, known as Papua-New Guinea. From July 1, 1969, Papua-New Guinea employed the prefix allocation VK9AA-VK9MZ (at the same time as Norfolk Island, Christmas Island and Cocos Island received their new allocations).

It is interesting to note that, despite being united, Papua and New Guinea continued to be listed as separate DXCC countries (both as VK9) until becoming deleted countries when independence came in 1975.

P29NG

Although it had become self-governing in December 1973, Papua-New Guinea became independent within the British Commonwealth on September 16, 1975. Since independence, the International Telecommunications Union prefix allocation has been P2A — P2Z, but the prefix P29 has been authorised by Government.

Incidentally, the NAA — NZZ serial letters denote novice licence holders and ZAA — ZZZ limited (VHF) licenses.

As stated on the reverse side of this special event QSL card, the logo shown was the official symbol of the 10th Anniversary of the Independence of Papua-New Guinea.

The Papua-New Guinea Amateur Radio Society organised activity nation-wide to celebrate the special occasion. Many thousands of such QSLs were sent throughout the world with the help of many participating amateurs belonging to the PNGARS.

The call sign suffix is significant and was obtained by special authority. The two symbolised birds shown are the famous Birds of Paradise, characterised by their gorgeous colours and bizarre forms of plumage, probably unsurpassed in splendour by any other bird species. Little wonder that these feature both on the official coat-of-arms of Papua New Guinea and its national flag.

If you are able to help the collection along with a donation of QSL cards, please contact Ken on (059) 64 3721 or write to PO Box 1, Seville, Vic 3139. Arrangements will be made for the collection or delivery of cards.

VK9DJ





Forward Bias

Norm Gomm VK1GN
GPO Box 600, Canberra, ACT 2601

MONTHLY MEETING

The September meeting saw Noel Schubert of Motorola talking about some of his company's communication products. Noel described a number of VHF/UHF mobiles and hand-helds. While the equipment had excellent specifications, including Mitspac ratings, the prices were well above the pockets of the average amateur.

After the break Noel described the Motorola Trunked Radio System, which allows a large number of independent users to share a group of radio channels to provide a more effective usage rate. The system consists of five channels (including a control channel). A central controller automatically switches radios between channels depending on availability. If all channels are busy then callers are put in a queue and called back in order of waiting. Noel claims that the system is an important step in relieving spectrum congestion.

JOHN MOYLE FIELD DAY 1989

Another reminder that if you have any suggestions, or wish to participate in the John Moyle Field Day, please contact the writer, Norm VK1GN, on 54 8512 at home.

EVATT PRIMARY SCHOOL BICENTENARY FAIR AMATEUR RADIO DISPLAY

The Evatt Primary School, Canberra ACT, held the Bicentenary Fair on September 17, 1988. The event proved to be a good opportunity for the local W.A. members to promote the hobby of amateur radio to parents and children in the Canberra community, and at the same time enable us to promote our special event call VIB8ACT on all HF bands.

We commenced setting up the station at around 9 am once the rain, which looked set-in for the day, had subsided. A an VK1WX, and myself, managed

to clamber onto the school roof and install the trapped vertical with little difficulty. Having secured the antenna to the metal roof we were surprised to find it tuned-up well on all HF bands, not requiring an ATU. The first contact was made to JA on 15 metres at 9.30 am with very poor reports being exchanged. Both 10 and 15 metres didn't appear to be improving so 40 metres was the order of the day.

Good contacts were made into most Australian States on 40 metres with a few mobile VK4 stations to keep the onlookers interested. Late in the afternoon, 10 metres heated up to an all time high with a pile-up of JA stations fighting to make that rare contact with VIB8ACT. This gave the public the opportunity to see the station in full swing making some 30 contacts in as many minutes.

The day was a great success with a total of 42 contacts in all to various countries, and numerous inquiries from the visiting public. Some were just mildly curious, while others seemed very interested, and kept the station operators busy discussing the world of amateur radio, the purpose and functions of the WIA, and the activities of our local Division.

Thanks to Alan VK1WX, Lawrie VK1KLB, Richard VK1UE and Ernie VK1NDV for their help and support in running the display.

—Contributed by Gavan Berger VK1NBS

JUGIONG PICNIC

On Sunday, September 25, 1988, Wagga and Canberra amateurs met at Jugiong for a barbecue and the battle of the fox hunts. It goes without saying that the Canberra amateurs were the epitome of sportsmanship and genteel behaviour, while the Wagga amateurs did some dreadful things to throw us off the scent. All jokes aside, the outing was rated as a great success by all who

attended and exemplified the spirit of amateur radio.

The VK1 Division would like to have more of such outings with other radio clubs in the area. If you are interested, please drop a line to Forward Bias.

JOTA 88

At the time of writing we will be running s.x JOTA stations in the Canberra region
VK1SAA — VK1SAF and VK1GGA VK1QAF

USE IT OR LOSE IT

A reminder that, with the improvement in conditions and corresponding increase in QSL cards it becomes even more important to assist our volunteer bureau operators. Please, Please, Please — make sure that you sort your cards into call areas before depositing them with the bureau. In addition, the call sign of the destination area should be written on the top right-hand corner of the back of the card.

Also note, VK1 cards go to the rewards bureau not outwards.

NOVICES ON TWO METRES

The VK1 Committee notes the increasing number of novices using two metres and is pleased to see, in general, good operating procedures being used. With the increased usage of the local repeaters, it is even more important to leave a few seconds between users in case someone else wants to pass an urgent message. If you have any queries on repeater or two metre operation please feel free to contact a member of the Committee for advice.

PRESIDENT'S CHRISTMAS MESSAGE

Have a safe Christmas. If you drink don't drive as I want to see you all back here next year.
73 de Alan VK1WX.

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VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW 2150

ALINCO TWO-METRE HAND-HELDS

Members will be aware of the special which has been on offer for the last couple of months from the new South Wales Division. Stocks are starting to run down but why not buy yourself a Christmas present? A review was published on this in the October issue of *Amateur Radio*. A specification sheet is available from the VK2 Division at PO Box 1066, Parramatta, NSW 2150. Please include a stamped self-addressed envelope. This offer has been extended to any licensed member of the WIA. The price is \$325 plus \$75 for cover post and packaging. All orders must include a recent address label from *Amateur Radio*, for example, the one with this issue. Cheque or Bankcard details with order.

NEW ADMINISTRATIVE SECRETARY

Maureen Lavery, who became the Division's Administrative Secretary in the latter part of 1982, the year the Division relocated from Crows Nest, left this position on October 20. On behalf of the members and council, we wish Maureen the best and our thanks for the time she spent with us. By now a new Administrative Secretary will be learning the ways of the Institute.

THE YEAR IS ENDING

Well, it is only a month to go until 1989 arrives to become just another year without the celebrations. The "Bicentenary of Australia 1788-1988 Award" contacts cease after December 31, 1988. You have until June 30, 1989 to submit a claim. For a VK2 to obtain the award, you have to work 200 different stations, anywhere. From the start of 1989, this award will be replaced with a VK2 Award, details next issue.

Should you need some blank Bicentenary QSL cards to cover replies to this year's contacts, check the Divisional Office for remaining stock. A new card will be released next year.

Did you work either of the special event award stations recently? VIB8WIA for the Fak Award on September 22, 1988 or the Parramatta Bicentenary Award last month, VIB8NSW. A special QSL card,

in addition to the award is available. Would you submit claims as soon as possible?

The AXPW broadcasts continue for the year on Sunday, December 18. They recommence on Sunday, January 8.

There will be special Divisional operation of VIB8NSW on December 31, 1988. The remainder of December is available for both club and individual use. Check the broadcasts or the Office for details.

This month is also the Rosa Hull Memorial Contest.

The Postcode Contest is on Friday, December 30, from 9 to 11 pm. The band is six metres, all modes.

The next Trash and Treasure should be the end of January!

The end of the year is also the time for all office bearers to prepare their annual reports and returns. It is also the end of the Divisional year.

PUBLICATIONS

If you need a Christmas present, why not check the Divisional Bookshop. They may have just what you want. You should also inquire and have your name put on the list for the 1989 ARRL Handbook or either the International or North American call books. Some stock should be available soon.

Providing there has not been further delays in the production of the Australian call book, this will also be available from the Bookshop.

NEW MEMBERS

A warm welcome is extended to the following who were in the October intake.

N G Burns VK2MDU
R Caruana Assoc
J C Churchill VK2VJS
A G Clanton VK2PPQ
J E Conway VK2VLL
C R Cooper Assoc
S A Gungun Assoc
S J Johnson Assoc
M J Lautzner VK2FSA
A M McDonald VK2NXQ

Bewong
Blacktown City
Maroubra
Sawtell
Saint Marys
Scint
Forestville
Sanctuary Point
Hurstville
North Ryde

J Matthews VK2ZDM
P L Middleton Assoc
G J C Palford Assoc
J F Patrick VK2AKJ
W N Southall VK2PRS
R R Stiebel
M A Wilson VK2AZZ
D M Young Assoc

Randwick
Dareton
Rydalmere
Lane Cove
Hockleyberg
Bexley
Sanctuary Point
Sydney

VK2 QSL BUREAU NEWS

Have you received any QSL cards from the bureau during the past six months? If not there could be a number of reasons for this:

1. You do not work DX.
2. No cards have arrived at the bureau for your call sign.
3. You have had a change in call sign or address and have not notified either the WIA or the bureau.
4. We do not have any credit for postage to enable us to send out your cards.
5. The club to which we were instructed to send your cards a now out of credit with the bureau or you have not been to collect your cards from them.

If reasons 3, 4 or 5 of the above can be answered with a yes, the volunteers at the bureau would be very pleased if you could remedy the problem.

We have quite a number of drawers which have large collections of unclaimed cards. As at the end of September, this bureau has handled in excess of 148 000 cards for this year. We try very hard to ensure that all cards reach the desired destination but as mere mortals, I find it difficult to read some call signs and to understand just what the amateur desires. With this number of cards coming in, sometimes in batches of 3 000, you could appreciate the time spent checking individual cards and sorting out the processing of all the others.

If there is any way in which we can be of assistance through the bureau, please contact us via PO Box 73, Teralba, NSW 2284, or telephone the Westlakea Club on (049) 58 1588. You will be surprised how often we are in attendance.

—Cheryl Stodden VK2 QSL Bureau Manager



VK3 WIA Notes

WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

NEW MEMBERS — WELCOME!

Geoffrey Coombes Ivanhoe
VK3BGC
Craig Dickson * VK3HE Northcote
Leon Evers VK3TEQ East Sa. n. Kilda
Ian Johnston * VK3SH East Ringwood
Malcolm Lee * VK3CLM Bangholme
Antonio Lucan * Stanley
Harold Murr * VK3KRM Christmas Hills
T. No Pavic * VK3EGN Geelong
Trevor Reid * VK3NNR Heidelberg
Paul Sane * VK3PSD Creswick North
Ivan Thomas VK3CVI Loch Sport
Mark Withers * VK3JCB Wedonga
Salah Romane * North Melbourne

* Joined with pink invitation to Join form

CAR INSURANCE

If you have amateur equipment in your car be very careful as to how you handle your insurance. After an incident in which one of my sons was involved and found his car (the middle of a sandwich) written off, he tried to recover some expensive audio equipment from the vehicle and was told it belonged to the insurance company.

Wondering how this would apply to an amateur and his radio gear I fronted my insurers and was told if my vehicle was written off the radio gear belonged to them. As I was not impressed with this answer, I wrote them a letter so that I could at least have the proof of what they had told me in writing.

The last thing most amateurs want is some clown in a wrecking yard playing Batman and Robin on the transmitting gear that has been left in his vehicle in the event it is a total loss after a smash. I feel that the DOTC would also take a rather dim view of this.

After several weeks the Wollongong office of the insurance company received word from Sydney that provided the equipment was noted on the

insurance and the vehicle insured for its full value plus the value of the equipment the following procedures could take place if the vehicle was ever "written off".

1. I could apply to the C.A.M.s Manager to buy the gear back at a price to be negotiated at the time.
2. If I didn't want the equipment they could sell it to a licensed operator, or
3. They could destroy it (In the meantime they had contacted DOTC and were given the message on unlicensed operators).

Far be it from me to cause you any falling out with your favourite insurance company but be warned — they have a very unbending set of rules when it comes to what is buried onto an insured vehicle. For your own benefit clarify the situation with them or you could be facing the daunting task of trying to get your gear back and they won't part with it.

This information from VK2EMV re car insurance was originally broadcast on VK2TV and is copyright to ANARTS

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Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5079

DISPLAY OF MEMBERS' EQUIPMENT NIGHT

Although the September meeting of the WIA VK5 Division was reasonably well attended, the amount of equipment displayed was very small this year. That is not to say that the quality was any less, just the quantity. Perhaps we are all turning into a nation of "Black Box Operators", or perhaps the "builders and tinkers" just prefer to do their thing at home, and not show it off at a meeting. The Millar Award, which is given, frequently, to encourage a newcomer, was awarded this year to Dave Goode VK5BF, for his Antenna Tuner and Power Meter. Now, as one of our well-known Old Timers, Dave hardly qualifies as a newcomer, but this was his first foray into the world of those caterpillar-like things that we call chips. Dave freely admits that he is much more at home in the world of "glowing glass bottles", but we hope that, with the encouragement award and the WIA voucher Dave will continue to build and experiment with those "caterpillars".

The other voucher winners were, Clarry Castle VK5SKL, for his "Sweep-Oscillator" and Mark VK5AVQ, for his Satellite Telemetry Decoder. It was decided not to award the KCS Award this time, as there was not one overall winner. Congratulations to all three winners and our thanks to Merv VK5MX, for donating the Millar Award and also for judging the entries. Might we tentatively suggest that the rest of you get out your soldering irons and junk boxes and start working on next year's September meeting.

NIGHTTIME BROADCAST

Once again we have had inquiries regarding the re-broadcasting of the Sunday Morning Broadcast, on perhaps a Sunday or Monday night. This one rears its head from time to time, and the answer is always the same — **volunteers needed!** The Division is happy to see it happen, DOTC have approved the idea in principle, all that we are short of are the people to do the work, so, if you are one of those who would find it much more convenient

to listen to the Broadcast any other time than Sunday Morning, please let a member of Council know and we will see if we can't get it "off the ground" this time!

DIARY DATES

Tuesday, December 6: WIA Christmas Social, Woodyile Community Hall, 64c Woodyile Road, Woodyile. Speaker is Dr Mike Tyler, reader in Zoology at Adelaide University. The topic is "FROG is a four lettered word". Bring your partner along to hear this hilarious speaker and enjoy the social gathering afterwards. Please bring a plate of supper to augment the Salad Platters, pies, pasties, sausage rolls and drinks provided by the W.A. Starting time is 8.00 pm.
January 24, 1989: Buy and Sell meeting at the BSB. This meeting will be preceded by ESC, QSL Bureau, and Publications Sales. We will endeavour to start at 7.30 pm.
January 31, 1989: No meeting.



WA Bulletin

John Sparkes VK6JX
VK6 PUBLICITY OFFICER
83 Anemone Way, Mullaloo, WA. 6025

The 1988 VK6 Hamfest was organised and held by the Northern Corridor Radio Group on Sunday, October 9 at Carine Technical College.

We are still recovering from what eventuated to be a great day which was extremely well attended by VK6 amateurs as well as members of the public. The weather was very kind, and we were grateful that the area was covered to stop sunburn — and not the expected wind and rain!

The following retailers generously donated prizes with the first four being present on the day with well-stocked stalls full of Hamfest Specials.

Dick Smith Electronics	Electronic Direction Finder
Kit	
West-Ann Electronics	Five-Eighth Wave
	Larsen Whip on magnetic base and boom
	24-hour clock
	Two Digital Multimeters

Will's Trading Worldwides Electronics

\$100 worth of parts voucher
Digital Multimeter

Atkins Carlyle

A very special vote of thanks is extended to these companies for their kind donations and their presence — we look forward to seeing you all again next year.

The WIA and other special interest groups were well represented as follows:

WIA Bookshop	WCEN
WIA Membership	ARDX SWL Club
AARTG	AMTOR
Packet Radio	ATV
Morse Workshops	Ten-Ten Club

Other displays included:

VK6WT's Morse key collection
Weather FAX
Restored equipment
Coaxial cable still
Cake stall (cakes donated by the ladies of NCRG members)

There was a fully operational satellite display out in the car park (conducted by VK6ZSB and friends), and there was even a working display of UHF CB equipment and repeater manned by UHF CBers.

Activities were very well patronised and included:

Bring and Buy sale
Car Boot sales
Two Auctions
QSL Card Raffle draw (for prizes)
Raffles
Home-brew Construction Competition with prizes
Kit Construction Competition with prizes
Free Skill Games and two Lolly Jar guessing games for the children

There was a mountain of food and drinks (which disappeared rapidly), competently sold by hard-working ladies, as well as a doughnut stand.

The NCRG believes it is in line for a special certificate or equivalent as nine new members joined the WIA at the Hamfest!

A sincere vote of thanks is given to the hardworking committee and all members of the NCRG, and their wonderful wives who made the 1988 Hamfest such a resounding success. Keep up the good work and next year's Hamfest can only get better.



QSP

HIGH POWER TRANSISTOR

A transistor able to handle 250 watts of RF has been introduced by Philips and aimed at the VHF FM transmitter market.

The new BLV37 operates from a 28 volt supply and the C case B device has a minimum power gain of 10.5 dB.

RF power of 3 kW can be achieved by putting 15 of them in cascade.

WORLD-WIDE BEACON SCHEDULE

Many radio amateurs are not aware of the world-wide beacon schedule on 14.100 MHz. There are 10 crystal controlled beacons that transmit for approximately one minute, one after the other over a 10 minute period.

Each transmits four series of 10-second dashes using 100 watts, 10 watts, one watt and 100 milliwatts.

Listen to the beacons and get a quick appraisal of where the band may be open around the world. They can also be used as a means of comparing receivers and antennas by switching them during the same 10-second dash.

The schedule is as follows

Time-slot 0	4U1UN/B	New York
Time-slot 1	W5WXB/B	California
Time-slot 2	KH6O/B	Honolulu
Time-slot 3	J2JGV/B	Japan
Time-slot 4	4X6TU/B	Israel
Time-slot 5	OH2B	Finland
Time-slot 6	CT3B	Madeira Island
Time-slot 7	ZS6DN/B	South Africa
Time-slot 8	LU4AA	Buenos Aires
Time-slot 9	HK4R/B	Columbia

Listen to 14.100 MHz and see if you can hear these beacons. It will also be appreciated if this frequency is left clear.

Over to You!



TRAVELLERS' NET

by Arthur Oliver VK6ART

When I obtained my full call on September 1, 1980, I was immediately involved in helping with the Travellers' Net. Keith VK6KC at that time stationed at Kun Bay, had been badgering me for some while to upgrade so that I could assist, as he was then experiencing reception troubles at his remote location. Bit by bit I found myself running the Perth end of the Net. When Keith retired and returned to Perth I thought I would be able to hand back to him, but for various reasons this did not work out and I therefore continued. In those days, the number of people participating each day varied from three or four to possibly a dozen and I have seen the Net steadily grow. On some days in the current year we have had more than 60 stations calling, of which more than 40 have been actually travelling. My computer has a list of nearly 1900 people who have called over the years and I am certain that many have been omitted from the days before I started computer records.

This means that I have been handing the Net for more than eight years. I am not getting any younger and I feel that the time has come when I should have a break from such a time-consuming commitment, around which my days have had to be organised. At the moment, there are any very able people helping with the Net, so it is opportune for me to hand over while they are still available and before I get too dodderly to run the Net efficiently. I therefore intend retiring from the control of the Perth end of the Net at the end of this year. I hope to be available to give a hand if and when required and to help out with special events, such as round-the-world yacht races, emergencies, etc.

I have enjoyed my time with the Net immensely and I have made many friends. I hope it has given good service to many and I am sure it will continue to do so. I have had tremendous backing from a large number of people, to all of whom I give grateful thanks and I hope to maintain contact with them from time to time. To all who have participated and particularly to my long-suffering wife, Eileen, thank you so much for having given me such an enjoyable and unique experience. Good luck to the Net and to all who run it in the future.

Yours in amateur radio,
Arthur Oliver VK6ART
9 Maycock Place
Orelia, WA. 6167

Roy Chamberlain VK6BO, telephone (09) 331 1825 will be stepping into Arthur's shoes, aided assisted by Peter Harrison VK6BH, telephone (09) 297 5772.

CANVAS SHACK LOCATION CORRECTION

by Ken Gott VK3AJU

It was flatter my to see a photograph of my canvas shack and myself in October AR among the 1988 John Moyer Memorial Field Day results and pictures. However, my QTH was not Mount Hotham, but Kinglake West.

I would like this correction recorded because of the help I received from rangers and other officials of the Victorian Conservation, Forest and Lands Department prior to the contest, and also in 1987 when I used the same QTH. None are amateurs, but all are helpful towards our hobby and appreciative of its role (via WVICN) in emergencies.

Also, I note that after propagation tests and related surveys by WVICN, a new VK3 144 MHz repeater is to be installed in the Kinglake area.

So Kinglake has got a few things going for it, apart from helpful rangers?

Yours sincerely,
Ken Gott VK3AJU
23 Waddell Road
Saint Kilda, Vic. 3183

PROCEDURE

by Ted Gabriel VK4YG

The Icom advertisement on the rear cover of AR for October, while extolling the virtues of one of their products and its advantages in improving communications nevertheless contains a horrible "boo-boo".

In radio telephone procedure there is no such thing as "Over and Out". In spite of Hollywood, CB radio, television serials or fiction writers, by definition it is a direct contradiction.

For newly licensed amateurs and advertisers who may not be sure of the exact meanings the following are the correct definitions.

OVER: My transmission is ended and I expect a reply from you.

OUT: My transmission is ended, I do not expect a reply.

So it is clear that they are not to be used together.

Ted Gabriel VK4YG
PO Box 245
Ravenhoe, Qld. 4672

LETHAL PACKET?

by Graham Rogers VK6RO

The Royal Navy used packet radio (via satellite) to obtain permission from London to sink the *Belgrano* during the Falklands War (true).

Don't sink our 20 metre band with packet radio about 140 MHz.

Yours,
Graham Rogers VK6RO
22 Grace Street
Fernside, WA. 6155

NO INCENTIVE!

by Paul and Jill Weaver VK6OF and VK6KOF

The government imposed fee for holding an amateur radio licence has gone up an extra two dollars. At the same time postage has gone up for an ordinary letter two cents. Perhaps bureaucratic thinkers at DOTS and Australia Post have some mutual formula that helps them determine how much they can take out of a service that has repeatedly demonstrated its usefulness in strategic and civil emergencies.

This husband and wife team see little financial incentive to encourage our four school age sons to take out a licence to use the same household equipment. The mathematics speak for themselves.

Yours sincerely,
Paul Weaver VK6OF and Jill Weaver VK6KOF
23 Waddell Road
Palmira, WA. 6157

OBJECTIVES

by Lindsay Lawless VK3ANJ

I applaud the new Federal President's intention to incorporate corporate management methods in our unincorporated institute.

He states his first task to be the setting of objectives, thus following the example of a well-known private company specialising in taking people up and down. We have had many ups and downs in the history of amateur radio. It will be a change to have these corporately managed.

Regarding objectives I believe these are already incorporated in the Articles of Association and I quote what I believe is the most important of the 16 listed:

"2. To represent generally the views of persons connected with amateur radio in the Commonwealth of Australia and its territories and dependencies." "5. To promote the development progress and advancement of amateur radio."

Those two are the key objectives and the task of incoming management is to pursue these and the other 14.

I would like to see the following words added to objectives 2 and 5 after the words amateur radio — "and the Amateur Radio Communication Service as defined in Article 1 of the ITU Radio Regulations."

There is a tendency to overlook the fact that not all radio amateurs are members of the ARCS. The ARCS is the only group of radio amateurs allocated spectrum space for defined purposes and objectives. An abrogation of those two surely mean a reduction or complete withdrawal of the allocations. The WIA must therefore regard promoting the development progress and advancement of the ARCS, as now defined as one of its most important objectives.

Yours sincerely,
Lindsay Lawless VK3ANJ
PO Box 112
Lakes Entrance, Vic. 3909

REMEMBRANCE DAY CONTEST

from Stan Dogger VK2KSD

Points should be awarded due to difficulty of making a contact ie

SSB — 4 points
 Morse — 1 point
 But subtract SSB - 2 points Black Box operation
 Add CW — 1 point Encouragement

Therefore, SSB-CW = equal points!
 Multiplier
 Count Novice CW 25 percent of score of CW contacts.
 Homebrew CW 25 percent of score of CW contacts
 SSB 50 percent of score of SSB contacts.
 Power SSB/CW 10 percent of score under five watt PEP
 Distance within VK 10 percent of score over 500 kilometres.
 73

Stan Dogger VK2KSD
Tunnel Road
Stokersiding, NSW. 2484

Persuade your company to
advertise in *Amateur Radio!*

IONOSPHERIC SUMMARY

The IPS Radio and Space Services summary for August contains the following information

The monthly averages are

10 cm Flux — 154.5

Sunspot Number — 111.2

A Index — 10.0

I Index 84.9

Flares - 7

Solar activity was mostly low in August. There were seven small M Class Flares during the month, mostly in the period from August 1 to 3. The largest flares for the month were the M2 Flares on August 1 and 233. The 10 cm flux varied considerably during the month, the highest value being 190 on August 31. The low for the month occurred on August 21-22 with a value of only 113. The monthly averaged flux value was 154.5 which is the largest observed for any month so far this cycle, but was only just above the previous month's value of 153.4.

The monthly averaged sunspot number was 111.2 which is just under last month's value of 112.6 — the largest this solar cycle! The yearly averaged sunspot for February 1988 was 64.5, up sharply from the previous month.

The Class M Flares occurred on August 1, 2, 3 (when there were two), 8, 23 and 25.

The geomagnetic field was very disturbed on August 9, an extended but relatively weak disturbance on August 12 to 15, the most disturbed being August 14. On August 20, the field was generally active throughout the day. On August 22, the field was very disturbed from 0000 UTC until around 0900 UTC. August 25, saw a sudden commencement occurred at 0930 UTC. All the geomagnetic disturbances were weak, August 22 being the most disturbed day with the A Index reaching a value of 22.

August was a good month for ionospheric propagation due to the high solar flux values during the month and the low level of solar activity and geomagnetic disturbance.

M or X Class Flares refer to the X-ray classification system for solar flares. In this system X Class Flares are more energetic than M Class Flares. Class M Flares have an X-ray power of

between 0.01 ergs/cm²/sec and 0.1 ergs/cm²/sec. Class X Flares are very energetic having X-ray powers greater than 0.1 ergs/cm²/sec.

The 10 centimetre Flux is the radio power of the sun at a frequency of 2800 MHz (wavelength 10.7 centimetres). This flux is a good indicator of solar activity and is widely used in place of the sunspot number. Unlike the sunspot, the 10 centimetre Flux never drops to zero even during a solar minimum. With no sunspots visible on the solar disc the 10 centimetre Flux will still have a value of around 67

SUNSPOT NUMBER	10 CM FLUX
0	67
20	78
40	93
60	110
100	147
150	195
200	243

SOLAR ACTIVITY AND SATELLITE LIFETIMES

All satellites in Earth orbit are subject to various perturbing influences which can alter their orbit. Satellites in low Earth orbit, with perigee altitudes below 2000 kilometres, are predominantly subject to atmospheric drag. This force very slowly tends to circularise and reduce the altitude of the orbit. The rate of 'decay' of the orbit becomes very rapid at altitudes less than 200 kilometres, and by the time the satellite is down to 180 kilometres it will only have a few hours to live before it makes a fiery re-entry down to the Earth. The temperatures attained during this re-entry are usually great enough to vapourise most of the satellite but if it is particularly large, or under certain conditions, component pieces may reach the ground.

The rate at which a low satellite orbit decays is a function of atmospheric density at each point along the orbit together with satellite's cross sectional area and mass.

The air density varies along the orbit, being a function of latitude and longitude, time of day, time of year and season. However, at a fixed point in

space, if we average the short time variations, we find that the density can be expressed in terms of two space environmental parameters. These are the solar 10 centimetres radio flux (F₁₀) and the geomagnetic index A_p. As each of these increase we find a corresponding increase in the atmospheric density at all tides above about 120 kilometres.

The uncertainty in prediction of the space environment coupled with unresolved variations in atmospheric density preclude us from being able to specify exactly when a satellite will re-enter the atmosphere. Even quite sophisticated programs can only claim a prediction accuracy not better than 10 percent. This means that one day before a particular re-entry is due, the uncertainty in time of fall will be at least two hours. The satellite will have circled the globe within this time span.

The graph in Figure 1 gives a very rough guide to the lifetime of a satellite with effective mass to cross-sectional ratio of 100 kg/m² in a circular orbit below 300 kilometres. Two cases of constant solar activity are considered, one representing solar minimum conditions, and the other solar maximum. The geomagnetic field is assumed to be quiet during this period. The lifetime values may be linearly scaled for satellites of differing mass to area ratios.

—Compiled by Frank Hwa VK2DL from information supplied by IPS Radio and Space Services

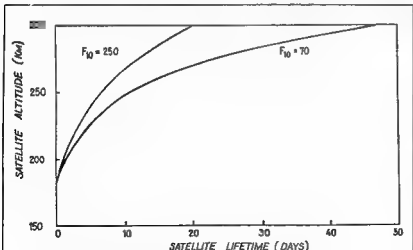


Figure 1.


A Call to all Holders of a

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11 am to 2 pm M to F and 7 to 9 pm Wed

HOW TO JOIN THE WIA

Fill out the following form and send to:

**THE MEMBERSHIP SECRETARY
WIRELESS INSTITUTE OF AUSTRALIA
PO BOX 300
CAULFIELD SOUTH, VIC. 3162**

I wish to obtain further information about the WIA.

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Call Sign (if applicable):

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HAMADS

TRADE ADS

AMIDON FERRIMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 millimetre SASE to: **BJ & US IMPORTS**, Box 157, Morildale, NSW 2223. (No inquiries at office please ... 11 Macdon Street, Orsley. Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza, ACT.

RADFAX2: Hi-Res radio facsimile Morse & RTTY program for IBM PC/DXT on 360K 5.25" floppy + full Doc. Need CGA, input port, SS8hf FSK/Tone decoder. Has re-align

auto-start view save print. Also "RF2HERC" same as above but suitable for Hercules card and "RF2EGA" for EGA card (640x350 mode). Programs are \$30 each + \$3 postage ONLY from M Delahanty, 42 Villiers Street, New Farm, Qld 4005. Ph: (07) 358 2785.

WANTED — ACT

KENWOOD FM-436 FM BOARD: YK-88CN CW filter, MS-1 mobile stand for TR-2500, MC-80A or similar scanning desk-top mic. VK1ZVR. Ph: (082) 58 9333.

WANTED — NSW

9 MHz OR 10.7 MHz CRYSTAL FILTER: Hy-Q OF980 OF10E7, Pye 90A or similar. As used in Building Blocks project from AR July 75. Jim Watson VK2XLL, C/- PO Stokers Siding, NSW 2484. Ph: (068) 77 9370.

RECEIVER: Amateur HF bands. No mods. Details to: N K Shaw VK2FJ, 16 Hynes Place, Camden East, NSW 2570. Ph: (046) 55 1577.

WANTED — VIC

OPERATOR'S OR TECHNICAL MANUAL: for Duab 1620 printer. Will pay cost for photocopying, etc. Contact Denis VK3VDR. Ph: (057) 65 2321.

WANTED — QLD

AUTOMATIC AERIAL TUNING UNIT: Ph: (071) 83 5162, reverse charges.

DOW-KEY: Two position antenna relay with external contacts. UHF or N-type connectors preferred. Also, connectors for FIJ50 1/2 inch Andrew Spiral Shield. Hardline (older type than LDF450) UHF or N-type female or male preferred. New or used okay. VK4QV (OTHR VK4AGQ). Ph: (07) 266 8107.

KENWOOD SW-200 COUPLER SWCs: Doug VK4XX, PO Box 57, Zillmere, Qld 4034.

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
 * Eight lines free to all WIA members, ninth line for name and address. Commercial rates apply for non-members. Please enclose a mailing label from this magazine with your Hamad.
 * Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment. (A courtesy note will be forwarded that the ad has been received and will appear in ... issue of AR.
 * Copy in typescript, or block letters to PO Box 300, Caulfield South, Vic. 3162
 * QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.
 Conditions for commercial advertising are as follows:
 \$22.50 for four lines, plus \$2.00 per line (or part thereof)
 Minimum charge — \$22.50 pre-payable
 Copy is required by the Deadline as indicated on page 1 of each issue.

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FOR SALE ☐

WANTED ☐

Name and Call Sign:

Address:

Phone Number (if applicable):

RADIO VALVE: Type No 7360 as used in FT-200. Price to: N Jones VK4N, 10 Bunceown Street, Ferny Grove, Brisbane, Qld. 4055. Ph: (07) 351 4955.

SIX METRE SSB TRANSCEIVER: Must be in "as new" condition. Willing to pay top price for good equipment. John Lauten VK4VK, 6 Toel Street, Sorrento, Qld. 4217. Ph: (075) 38 5188 (BH) or (075) 38 1758 (AH).

QUALITY RECEIVER: R1000, R2000 or similar. Details to John VK4SZ, QTHR. Ph: (070) 81 3288.

WANTED — SA

KENWOOD TS-120S OR TS-130S. Will pay transport costs. Contact Tony VK5AH, QTHR. Ph: (08) 42 2037.

WANTED — WA

70 CM SWR COUPLER: for Kenwood meter SWR-200 (Model Key SWR-2). Also, active antenna preamp/tuner for FRG-7700 com rx. Will pay reasonable market price. Call Allen. Ph: (09) 448 0097.

FOR SALE — ACT

SHACK CLEARANCE: Kenwood TS-620 in good condition. \$500 ONO. MRL-1224 RTTY/CW modem with software & TRS-80C computer. \$400. TP10 Printer \$80. WM-7000 watt meter \$20. Learning aids to full call and Morse Tutor lecture notes, etc. Ian L10124. Ph: (062) 54 4869.

YAESU FC-301 ANTENNA TUNER: 500W, 160-10 metres, with manual & original carton. \$250. Pair of new RCA 6164A, \$50 the pair. Muffin fans, 115V \$5 ea. Digital DECADE II computer, 10 MB hard disc, twin floppies, 4 operating systems, heaps of software, incl WP: Corvus, Database, Spreadsheet, Basic, Fortran, Graphics. \$2500. VK1ZVR. Ph: (062) 58 9333.

FOR SALE — NSW

KENWOOD TS-620: with CW filter, speaker & audio filter, external VFO, service manual, extras. \$650. Antenna (USA) Wilson SVS-1, 3 band, 4 element, Yagi, installation book. \$250. All in good condition. Ph: (02) 529 3668. Licensed Amateurs Only.

KENWOOD TS93X (TS-930): in mint condition. Built-in power supply & antenna tuner. \$2000. Contact Harry VK2CAJ, QTHR. Ph: (02) 455 2178.

SHACK CLEARANCE: FT-780R & FT-480R 70 cm & 2m all-mode transceivers. \$600 each. Kenpro KR-500 elevation rotator. Never used. \$400. 75W 2m linear amp. \$180. Toyo VHF/UHF SWR/Watt meter. \$175. VHF/UHF 2 pole antenna switch. \$40. 17 el 70 cm Yagi. \$40. Shure 444 dynamic mic — the best. \$125. Antenna mast 4m plus guys, hardware, mount. \$50. Partially built 2m GASPEF preamp plus OSCAR decoders. Larry Gagnon VK2EY, 59 Fromelles Avenue, Sealhorn, NSW. 2092. Ph: (02) 949 3124 (AH) or (02) 929 6455 (BH).

YAESU FT-ONE TRANSCEIVER: in exceptionally good condition. This is a general coverage, all mode, 100W HF transceiver. Has all optional extras & microphone. Hardly used. \$1950. VK2EHL. Ph: (302) 918 9035. Licensed Amateurs Only.

FOR SALE — VIC

COLLINS KWM 2A 516 POWER SUPPLY: Dix Eng Comp unit. Noise blanker, good supply tubes. Collins 7553 Rec fully solid state. Offers invited. Also, 312 B-5 Collins control unit. Hy-Gain Hi Tower Vertical Antenna. Covers 10 to 160 metres. Hal VK3MM. Ph: (03) 354 3886.

KENWOOD TS-520S: Original, had very little use since new. PC DGS Digital Readout, has drypoint problems. \$600 for both — no offers. Original packing. Also, Bendix Freq Meter LM-10 (similar BC 221). WWW Collectors item. What offers? Bob VK3AQK, QTHR. Ph: (057) 44 1678.

TOWER: 14 MHz Southern X self-support motorised for lifting. Also, three band quad rotor indicator & cables. SSTV trans recov, colour boards, cameras, etc. Ph: (055) 62 3361 for details.

YAESU FT-77: in perfect condition. WARC bands, FM board. \$850. Murray VK3CGC. Ph: (03) 305 5430.

FOR SALE — QLD

YAESU FT-1: including Yaesu external speaker & Yaesu desk mic. Recently professionally service checked. \$2850. Will consider near offer. John VK4SZ, QTHR. Ph: (070) 61 5888.

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That's what you get when you attach the optional IC-BP7 battery pack to the new IC-2GAT from ICOM. And even the IC-4GAT pumps out 6 watts with the same battery pack.

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